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IMPLICATIONS OF THE REPUTATION EFFECT ON PRIVATE EQUITY-BACKED COMPANIES' GOVERNANCE

Evidence from European Debt Capital Markets

Master's Thesis
Jari Aalto
Aalto University School of Business
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Aalto University, P.O. BOX 11000, 00076 AALTO
www.aalto.fi

Abstract of master's thesis

Author Jari Aalto

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Abstract

The purpose of this thesis is to study the reputation effect of European private equity investors. I aim to answer the question of whether European debt investors view private equity owners as large exploitative shareholders that take advantage of their portfolio companies' bondholders, leading to investors demanding higher yield spreads on the PE-backed companies' debt. I focus my analysis on the European debt capital markets and corporate loan markets by studying the bonds and loans issued by PE-backed and non-PE-backed companies from 17 European countries during the period between January 1, 1981 and June 30, 2015. I construct the sample by distinguishing between whether the debt issuer was backed by a private equity or venture capital investors on its IPO and construct two time period samples, the focused [IPO+0, IPO+6] sampling period and the full [IPO+0, IPO+12] sampling period.

I test my hypotheses by creating a private equity dummy variable (PE_DUM_t) that takes the value 1 if the debt issuing company was backed by a private equity investor on its IPO and zero otherwise. I then run a series of multivariate analyses studying the relationship of private equity ownership and different credit metrics of the bonds and loans (credit ratings, bond yield spread and loan spread) as well as study the investment and payout policy changes (capital expenditure, dividends and share repurchases) over the three years following a bond or loan issuance.

My analysis yields three main results; first, bond yield spreads (loan spreads) for European PE-backed companies are on average 93 pp (70 pp) higher when comparing to the general set of other IPO companies over the first six years after their IPO. Second, European private equity-sponsored firms are rated on average two notches lower than their non-sponsor counterparts by Moody's during the first six years after the company has been listed. Finally, private equity-backed companies invest less and pay lower amounts of dividends over the three-year period following a debt issuance relative to the size of the firms, when compared to the non-PE-sponsored firms. When contrasting my results to a similar US-based study of Huang et al. (2016), I find that debt investors to view European private equity ownership somewhat differently from the North American PE ownership. However, I observe no evidence of exploitative governance structures in PE-backed companies and suggest that the reputation effect plays a vital role in ensuring that bondholder friendly governance structures are implemented in PE portfolio companies.

Keywords reputation effect, private equity, financial sponsors, credit ratings, cost of debt, post-IPO operating performance, corporate governance

Aalto-yliopisto
Kauppakorkeakoulu

Aalto-yliopisto, PL 11000, 00076 AALTO
www.aalto.fi

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Tiivistelmä

Tämän pro gradu –tutkielman tavoite on tutkia sijoittajamaineen vaikutusta eurooppalaisten pääomasijoittajien hallinnointiin. Tavoitteenani on vastata kysymykseen siitä, koetaanko eurooppalaiset pääomasijoittajat haitallisina ja suurina kohdeyhtiöiden joukkolainasijoittajia hyödyntävinä toimijoina, joka näkyisi pääomasijoittajaomisteisten yhtiöiden kasvavina rahoituskustannuksina. Keskityn analyysissäni eurooppalaisille joukkovelkakirja- sekä lainmarkkinoille ja tutkin niin pääomasijoitteisten kuin muiden yhtiöiden liikkeelle laskemia joukkovelkakirjalainoja sekä pankkilainoja. Aineisto koostuu 17 eri Euroopan maasta tulevasta yhtiöistä, jotka ovat listautuneet pörssiin ja nostaneet velkarahaa 1.1.1981 ja 30.6.2015 välisenä aikana. Aineisto merkitään se, onko velkaa liikkeelle laskeva yhtiö ollut pääomasijoittajaomisteinen yhtiön listautuessa pörssiin vai ei. Tämän lisäksi luon kaksi vaihtoehtoista aikaikkunaa, jotka tutkivat seuraavaa kuutta ja kahtatoista vuotta yhtiön listautumisen jälkeen.

Testaan hypoteesejani luomalla pääomasijoittajamuuttujan joka saa arvon 1 velkakirjan ollessa pääomasijoittajataustainen ja arvon 0 muutoin. Analysoin muuttujaa erilaisia velkametriikoita (luottoluokitus, velkakirjan hinta) vasten sekä tutkin muutoksia investointi- ja osinkopolitiikassa velan noston jälkeisten kolmen seuraavan vuoden aikana.

Analyysilläni on kolme keskeistä tulosta. Ensimmäiseksi, joukkovelkakirjojen hinta (pankkilainan hinta) on eurooppalaisille pääomasijoitteisille yhtiöille keskimäärin 93 peruspistettä (70 peruspistettä) muita yhtiöitä korkeampi kuuden listautumisantia seuraavan vuoden aikana. Toiseksi, eurooppalaiset pääomasijoittajaomisteiset yhtiöt on luokitettu kaksi luottoluokitusyksikköä verrokkiyhtiöitä heikommin Moody's-luottoluokittajan toimesta. Viimeiseksi, pääomasijoittajaomisteiset yhtiöt investoivat vähemmän ja maksavat vähemmän osinkoja kokoonsa nähden kolmen lainannostoa seuraavan vuoden aikana verrattuna muihin aineiston yhtiöihin.

Verrattuna yhdysvaltalaisella aineistolla tehtyyn tutkimukseen (Huang et al., 2016) tulokseni osoittavat, että velkasijoittajat näkevät eurooppalaiset pääomasijoittajat yhdysvaltalaisista pääomasijoittajista poikkeavalla tavalla. Tutkimukseni ei kuitenkaan löydä eurooppalaisesta pääomasijoittajaomistuksesta kohdeyhtiöiden joukkolainasijoittajia haitallisesti hyödyntäviä hallintomalleja. Osoitan tutkimuksessani myös pääomasijoittajien sijoittajamaineen ajavan pääomasijoitusomisteisten yhtiöiden pörssilistautumisen jälkeistä hallintoa velkakirjaomistajien näkökulmasta positiiviseen suuntaan.

Avainsanat sijoittajamaine, pääomasijoittaminen, luottoluokitukset, velan hinta, pörssilistautumisen jälkeinen hallinnointi

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1. Introduction

1.1 Motivation

Private equity (PE) firms have increased their global presence significantly in the last few decades urging researchers to study the implications of private equity ownership in a firm's performance and operations. Prior research (e.g. Brav & Gompers, 1997; Guo et al., 2011) has extensively covered e.g. the ways in which private equity owners generate wealth during their management stage and how private equity-backed companies perform in the stock market after the PE owner has exited the portfolio company through an initial public offering (IPO). Further, the reputational concerns of private equity owners as repeat backers in IPOs and repeat borrowers through leveraged buyouts (LBOs) has perplexed researchers as reputational concerns seem to outweigh PE investors' equity maximizing practices (e.g. Cain et al., 2012). However, although private equity owners commonly raise debt for their portfolio companies, fairly little is documented on the relationship between PE owners and bondholders after the company has gone public.

Huang et al. (2016) study this relationship using a sample consisting solely of US-based companies and find that, although private equity owners are known for their equity value maximizing practices, they are also very concerned about their reputation as repeat borrowers (Megginson and Weiss, 1991; Cain et al., 2012). Huang et al. (2016) find that due to the PE owners' frequent interaction with debt investors, private equity-backed companies receive bond financing with on average 70 basis points lower yield spreads than other companies do, suggesting that their owners' long-term reputational concerns outweigh the hunt for short-term returns. Huang et al. (2016) find evidence that the less expensive financing and better credit quality stem partially from the less aggressive investment and dividend policies that PE-backed companies have adopted. This behavior of implementing governance structures that act in favor of the owners' reputation is commonly referred to as the reputation effect.

Given the private equity firms' significant operations outside the US, my motivation for this thesis is to first bring the study of Huang et al. (2016) to the European context, contrast my

findings with their results from the more established American private equity industry[1] and finally amend the scope of the previous study by examining whether the effects of private equity ownership are also visible in the loan market of the more bank-centered Europe[2]. Thereby, I aim to answer the question of whether European debt investors view private equity owners as large exploitative shareholders that take advantage of their portfolio companies' bondholders, leading to investors demanding higher yield spreads on the PE-backed companies' debt. Further, I ask whether the reputation effect among PE owners is as strong in Europe as it is in the US, where private equity firms are highly concerned about their reputation and where, by implementing bondholder-friendly investment and payout policies, PE portfolio companies have achieved better credit metrics when compared to non-PE-backed companies. Finally, due to the nature of the European debt market, I ask whether the effect of private equity ownership on credit metrics also transfers to the European loan market.

1.2 Background

Private equity and venture capital investments have been a source of companies' financing for decades, but the PE industry has experienced an explosive growth over the last 30 years. Kaplan and Schoar (2005) conclude that while annual PE investment amounted to less than $10 billion in 1991, the amount had grown to over $180 billion at its peak year in 2000. Metrick and Yasuda (2010) report that by the year 2010, global private equity investment stood at approximately $1 trillion and with the industry's significant propensity to lever their investments, total investment size can reach up to $4 trillion. The industry has been largely focused on the North American markets in the past with approximately over 85% of private equity funds residing in the US (Robinson and Sensoy, 2011). However, private equity activity has also increased in Europe over the last few decades with average annual investments amounting to €50 billion between 2013 and 2015 and the total investment stood at €560 billion in 2015 (Invest Europe, 2015)

Private equity funds typically operate in four distinct stages. In the fundraising stage, PE funds source equity investments from institutional investors and wealthy individuals to grow their fund for future investments made in the next stage. The investment phase generally begins after

[1] Prior Private Equity research has shown the US to have the most prominent and established PE industry (e.g. Armour and Cumming, 2006; Cumming and Walz, 2010).

[2] Bank loans amount to nearly 45% of corporate debt in Europe and less than 20% in the US due to the lack of public data on firms' creditworthiness in Europe and the great efficiency of banks acquiring the private information (De Fiore and Uhlig, 2005).

the fund has reached its target size and the PE investors start sourcing for companies that meet their investment criteria, which is then followed by acquisitions of chosen portfolio companies. In the third management stage, PE owners are actively involved in the company's operational decisions and management for a predetermined holding period. Usually after the holding period is over, PE owners sell their ownership, usually to a strategic or financial buyer or take the company public through an IPO. (Invest Europe, 2015). As private equity investors are actively involved with institutional investor and lenders in all of the four stages, reputational aspects are crucial in securing successful continuation of their business in the long-term (e.g. Gompers, 1996; Brav and Gompers, 1997).

1.3 Contribution to existing literature

This thesis builds upon and amends four main areas of research. First, the post-IPO performance of private equity-backed companies has been widely covered, especially from the equity market performance view (e.g. Cao and Lerner, 2009; Krishnan et al., 2011; Levis, 2011), however, by analyzing the credit metrics and post-IPO governance structures of private equity portfolio companies, this thesis offers unique insight into the post-IPO credit market performance of European private equity-backed companies. Second, this thesis complements the existing literature on ownership structure and cost of debt (e.g. Aslan and Kumar, 2012; Elyasiani et al., 2010; Lin et al., 2011) by providing evidence on the cost of debt for European private equity-backed firms.

Third, this study further examines the reputational concerns of PE firms that affect the way they govern their portfolio companies (e.g. Cain et al., 2012; Demiroglu and James, 2010; Diamond, 1989; Tyková and Borell, 2012) by providing insight into the topic from the European private equity owners' reputational concerns. Fourth, the thesis adds to the literature on wealth transfers through investment and payout policy decisions (e.g. Harford and Kolasinski, 2014; Kalay, 1982; Maxwell and Stephens, 2003) by studying the investment and payout decisions (dividends and share repurchases) of private equity-backed companies following a large influx of capital through a bond issue.

Further, this thesis also carefully analyzes the similar study conducted by Huang et al. (2016) on private equity investors' reputational concerns in the US and makes three contributions to

their research. First, using a larger data set[3], I expand the geographic reach of the topic by studying the implications of PE investors' reputation effect in Europe. Second, Huang et al. (2016) only conduct their study with public bonds, whereas I analyze a novel data set of European corporate loans[4]. Finally, with the paper by Huang et al. (2016) only testing for the exploitative behavior of PE ownership with investments and dividend payments after a bond issuance, my novel share repurchase data set complements the methodology by introducing the preferred payout method of sponsor-backed companies[5] into the scope of the analysis.

1.4 Main findings and limitations

This thesis finds debt investors to view European private equity ownership somewhat differently from the North American PE ownership and makes three main findings in this space. First, bond yield spreads (loan spreads) for European PE-backed companies are on average 93 pp (70 pp) higher when comparing to the general set of other IPO companies over the first six years after their IPO. Second, European private equity-sponsored firms are rated on average two notches lower than their non-sponsor counterparts by Moody's during the first six years after the company has been listed. Finally, private equity-backed companies invest less and pay lower amounts of dividends over the three-year period following a debt issuance relative to the size of the firms, when compared to the non-PE-sponsored firms.

Thus, although I find that the European private equity-owned companies are viewed inherently riskier in terms of their credit metrics compared to the non-sponsor-backed firms, I observe no evidence of exploitative governance structures in PE-backed companies and argue that the reputation effect plays a vital role in ensuring that bondholder friendly governance structures are implemented in PE portfolio companies.

Evidence form the North American market (Huang et al., 2016) is slightly conflicting and suggests that PE-backed companies have better credit ratings, receive bond financing with lower yields. Further, they invest more modestly and pay out less dividends in the three years after a debt issuance, when compared to the non-PE-sponsored companies. My analysis yields

[3] My focused sample of European bond observations amounts to 486, whereas Huang et al. have a data set of 329 individual bond observations from the US.
[4] My focused sample of European corporate loans features 192 individual loan observations.
[5] Jain et al. (2009) report that venture capital-backed companies were significantly more likely to repurchase shares than pay out dividends.

novel results to the European market on PE-sponsored firms' credit ratings and cost of debt and confirms the earlier findings by Harford and Kolasinski (2014) and Huang et al. (2016) that PE owners do not exploit bondholders by transferring wealth through overinvestment and excessive payout policies.

This thesis introduced two novel aspects that have not been researched in the setting of private equity ownership prior to this study, i.e. my corporate loan sample as well as accounting for share repurchases as one of the payout methods. However, the corporate loan sample proved to be rather thin on observations on private equity-backed companies, especially in the focused sampling period, which slightly affects the comparability of the two debt types. Additionally, although the loan data set should be cleaned of any non-withdrawn loans, there is a chance of loans of this type ending up in the final sample and their dissimilar pricing structure might have its effect the loan spread analysis. Further, fact that they are not actually withdrawn might distract from obtaining a proper results for the investment and payout policy analyses that rely strongly on the date when the loan was withdrawn by analyzing the subsequent three-year period.

1.5 Structure of thesis

This study is structured in the following way; Section 2 introduces the pre-existing literature and summarizes the main findings around the topics. Section 3 presents the theoretical framework behind my study and outlines my five hypotheses. Section 4 describes the formation of the debt capital markets and corporate loan data sets, provides definitions for the variables used and thoroughly explains the methodologies used in analyzing the effect of private equity ownership on both a company's credit metrics as well as on its investment and payout decisions following a bond issuance or a loan withdrawal. Section 5 summarizes the empirical results of the analyses and Section 6 discusses these results in detail with respect to my hypotheses and prior academic literature. Section 7 concludes the thesis and discusses possible topics for follow-up research in the future.

2. Literature review

This section summarizes the four distinct ways in which this thesis contributes to prior academic literature. First, I discuss findings around the theme of operational performance of private equity-backed firms following their IPOs. Second, I address prior literature discussing a firm's ownership structure and the cost of debt. Third, I discuss past research conducted on the reputational concerns private equity investors face. Finally, I present past studies conducted on wealth transfers through investment and payout policy decisions

2.1 Post-IPO operational performance of private equity-backed firms

The performance of private equity-backed companies after their initial public offering has been studied fairly extensively in academic literature over the last decade following the noticeable increase in private equity investment and activity in the market. Past research on the topic has largely centered on studying the stock market performance of the private equity-backed firms. Barry et al. (1990) was one of the first papers to study the operational performance of sponsor-backed companies after their initial public offering and their research concludes that the market does seem to recognize the value private equity ownership, as they observed that IPOs with higher-quality venture capitalist involved were less underpriced compared to the non VC-backed peer group.

Muscarella and Vetsuypens (1990), Degeorge and Zeckhauser (1993), Mian and Rosenfeld (1993) and Brav and Gompers (1997) were among the first ones to study the longer-term performance of reverse leveraged buyout[6] (RLBO) firms after their IPO. Muscarella and Vetsuypens (1990) conclude that reverse LBOs generate significant improvements in profitability of the firms when compared to a sample of non-sponsor-backed companies, which largely stem from efficient cost-cutting programs and increased revenues. Degeorge and Zeckhauser (1993), on the other hand, find that the operating income divided by total assets of reverse LBO companies exceeds that of the reference group before the IPO, but the sponsor-backed companies fall below their comparable non-sponsor-backed companies in the post-IPO period. Mian and Rosenfeld (1993) find significant abnormal returns in stock market

[6] Reverese leveraged buyout (RLBO) refer to the process when former a leveraged buyout target company is listed again after the LBO investor's holding period in the company.

performance of reverse LBO companies over a three-year period, which was largely the result of further takeover activity in the post-IPO period. Brav and Gompers (1997) also studied the underperformance of IPOs and their study implies that venture capital-backed companies outperform the non-VC-sponsored firms over a three-year period following their IPO. They suggest that the outperformance is partly a result of favorable long-term governance structures implemented by the venture capital owners to avoid tarnishing their reputation as a repeat sponsor on IPOs, as the investors of the venture capital funds may be the very same institutional investors taking part in the IPO.

The second wave of post-IPO performance has been most notably covered by Cao and Lerner (2009), Cao (2011), Guo et al. (2011) and Krishnan et al. (2011), as the research focus shifted especially towards reverse leveraged buyouts. As private equity sponsors increasingly sourced for new portfolio companies from the public equity markets and acquired listed companies through leveraged buyouts, many of these companies were listed again after the holding period once the private equity owners chose to divest their ownership in the former LBO companies through an RLBO. Cao and Lerner (2009) studied the stock market performance of 526 RLBO companies up to three and five years after the initial public offering. The authors suggest that RLBOs outperform other IPOs of the same size and industry and find backing for the better performance from the better profitability of the companies. Further, Cao and Lerner (2009) conclude that the high leverage of the RLBO companies does not affect the post-IPO performance in a negative way, although their outperformance does revert when comparing the performance between three and five years since the IPO.

In a later study, Cao (2011) finds that the post-IPO performance of RLBOs depends on the duration of the holding period, i.e. the time the private equity owner stays invested in the company, which again is partly a result of the IPO market conditions. The author finds evidence that when the market conditions are favorable, private equity owners tend to list the former LBO companies faster, whereas around unfavorable market conditions, PE investors hold the companies longer in their portfolios and refrain from listing the firms. Cao (2011) concludes that RLBOs with a short pre-IPO duration tend to experience poorer post-IPO performance relative to non-sponsor-backed peers, whereas RLBOs with a longer holding period perform in line with non-sponsor-backed peers, suggesting partly that the operational efficiencies created during the PE ownership persist longer post-IPO when the pre-IPO duration has been long.

Guo et al. (2011) study the post-IPO returns of buyout companies over time and find that, although LBO and RLBO companies have outperformed the non-sponsor-backed firms post-IPO, the gains from operational performance have decreased when moving from the 1980s to the 2000s. However, they do still suggest that some portion of the outperformance stems from operational factors, e.g. CEO replacement, changes to cash flows and tax benefits, which are likely the result of governance structures implemented by the PE owners. Krishnan et al. (2011), on the other hand, study the post-IPO performance of venture capital-backed firms and find that companies backed by more reputable VC investors record a significantly better long-term post-IPO performance than the companies owned by less reputable sponsors. Studying the period of up to three years after the initial public offering, the authors conclude that the more reputable investors are better in selecting the target companies as well as implement better governance in the portfolio companies.

With the initial studies on sponsor-backed companies' post-IPO performance focusing greatly on the North American private equity investors, Jelic et al. (2005), Chachine and Filatotchev (2008), Levis (2011) and Van Frederikslust and Van Der Geest (2011) were among the first to study the implications in the European market. Jelic et al. (2005) study the post-IPO performance of previous management buyout (MBO) companies in the UK and distinguish between whether a VC investor was involved in the buyout or not. The authors do not find venture capital-backing to be a significant determinant of the post-IPO performance, but similar to Krishnan et al. (2011) they find firms sponsored by highly reputable VC investors to perform better post-IPO than the companies backed by less reputable venture capitalists. Chachine and Filatochev (2008) also record a similar sponsor reputation-linked effect on post-IPO performance in the French IPO market, but observe that VC-sponsored IPO companies perform better relative to the non-sponsor-backed companies over the next full year since the initial public offering as well.

Levis (2011) studies the post-IPO operational performance of UK-based PE-backed companies, and finds that PE-sponsored IPOs outperformed the non-sponsor-backed listings, which can partly be explained by larger sales, asset base and better profitability of the sponsor-backed companies post-IPO, when compared to the other IPO companies in the sample. Levis (2011), however, points out that PE-backed firms were clustered in only a few sectors, which can affect comparison with the general sample of companies. Van Frederikslust and Van Der Geest (2011) study the IPO market in the Netherlands and observe PE-backed companies to outperform the

non-sponsor-backed firms over the next three years after the IPO. The authors conclude that the higher sales growth rate of sponsor-backed companies positively affects the long-term post-IPO performance.

2.2 Ownership structure and cost of debt

Pricing of debt instruments is a complex process that has intrigued researchers for decades, as it combines, among others, elements from debt issue-related factors, borrower fundamentals and the overall creditworthiness of the borrower. One key element of the process has been linked to the ownership structure of a borrower, as certain governance structures are better in mitigating agency costs and information asymmetries, aspects that are generally viewed credit negative by the lenders. Jensen and Meckling (1976) were among the first ones to document the exploitative behavior of managers and large shareholders at the bondholders' expense, and conclude that certain organizational forms lead to self-benefit maximizing practices. Diamond (1984) on the other hand studied the mitigation of information asymmetries between private lenders, i.e. banks and public bondholders. The author concludes that due to their bilateral access to non-public information on the borrower, banks are more effective and more cost efficient in monitoring the creditworthiness of companies than public bondholders. Thus, with the greater availability of information, banks should perform better in mitigating information asymmetries and thereby price loans more accurately than the public market prices bonds.

Since the 1980s, the research has shifted towards studying in greater depth how specific ownership and governance structures affect the cost of bond or loan financing. Inspired by the managerial self-interest side of agency costs, Barclay et al. (1993) study managerial block ownership and find that blockholders are able to secure several private benefits that might negatively affect the wealth of minority shareholders and debtholders. Thus, with an increasing agency risk, large managerial blockholdings are considered to have a negative effect on bond ratings and yields. Ortiz-Molina (2006) also studies the relationship of managerial ownership and a company's borrowing costs and find similar results as Barclay et al. (1993), suggesting that a greater degree of managerial ownership is related to higher borrowing costs. The author also concludes that managerial stock option holdings affect the bond yields more than stock ownership does, with stock options providing a greater incentive for higher risk-taking. This possibly riskier governance of the firm is then adequately priced into the higher yield spreads that investors demand. A newer study by Aslan and Kumar (2012) examines the relationship of

a concentrated ownership and syndicated loan prices, with prior research focusing more on the public debt market. Although Diamond (1984) concluded that banks are better in mitigating information asymmetries, Aslan and Kumar (2012) still observe that a greater control concertation leads to higher loan spreads demanded by the banks, as a result of the governance structures that are viewed less friendly towards the lenders of the firm.

Along with managerial ownership, the large involvement of institutional investors and their role in mitigating informational asymmetries has been carefully studied in past literature. Bhojraj and Sengupta (2003) study the relationship of institutional ownership and agency risk in the US and find conclusively that companies with a large institutional investor base have better governance mechanisms that mitigate informational asymmetries between the equity holders and bondholders. The authors conclude that the reduced agency risk results in higher credit ratings and lower yield spreads on the issuing company's bonds, but similar to past literature on concentrated ownership (e.g. Barclay et al, 1993; Aslan and Kumar, 2012), the presence of institutional blockholders has negative effects on a firm's credit quality and cost.

Roberts and Yuan (2010) study the similar setting to Bhojraj and Sengupta (2003) in the loan market and their research yields similar results. Roberts and Yuan (2010) find that also in the loan market, a higher degree of institutional ownership relates to lower financing costs through institutional owners' active role in the firm's corporate governance. Further, the authors validate that concentrated institutional ownership has adverse effects on the loan spreads of the firms, however, with the financing costs remaining lower than those of the companies with little or no institutional investors. Elyasiani et al. (2010) take a slightly different approach when studying the implications of institutional ownership and focus their research on distinguishing between the stability, i.e. long-term orientation vs. short-term orientation, of the institutional investors. Their study shows that institutional ownership, in general, has a positive effect on the cost of debt, but the observation is actually the result of a stable long-term orientation instead of the institutional ownership per se. Elyasiani et al. (2010) suggest further that a shortsighted less stable institutional ownership affects large companies' borrowing costs more adversely than the costs of smaller companies.

Anderson et al. (2003) examine the implications of founding family ownership in large listed companies on the perceived agency costs of debt financing. The authors find that, regardless of whether the family is a large blockholder or not, family ownership is negatively related to the

cost of debt financing. The observation of Anderson et al. (2003) suggests that family owners have a unique way of alleviating informational asymmetries, which stems from their assumedly longer-term investment horizon and that this commitment is rewarded with, on average, 32 basis points lower cost of financing.

Saunders and Steffen (2011), on the other hand, compare private and public ownership in the UK and its implications on the cost of loan financing. Their research concludes that due to greater information asymmetries and less bargaining power, private companies pay on average 27 basis points higher loan spreads than similar listed companies would pay. Interestingly, Saunders and Steffen (2011) also find some evidence that after a private firm goes public, private equity involvement can have a negative implication on the cost of debt for the listing company. The effect observed by the authors is especially strong if the company was listed on a small stock exchange, but it does not fully disappear even if the company listed on a larger secondary marketplace. Borisova and Megginson (2011) study the effects of government ownership on the cost of debt and note that when governments divest their holdings, credit spreads increase. The authors explain the phenomenon with increasing uncertainty and lesser transparency of ownership as well as the material and assumed guarantees implied by the reputation of the government.

Lin et al. (2011) take a novel approach in studying the relationship between ownership and cost of debt by analyzing the separation of control rights and cash flow rights in ownership. The authors claim that dual-class shares and pyramid ownership structures allow some minor shareholders to hold much of the ultimate control rights without having a significant stake in the company's cash flows. Lin et al. (2011) find that the divergence between control and cash flow rights results in higher loan spreads and that the effect is especially strong in the case of family-owned companies, increased informational asymmetries and low credit ratings. While much of the research has directly focused on the cost of financing. Ashbaugh-Skaife et al. (2006) study the relationship between corporate governance and credit ratings and document that the governance structures that are viewed credit negative by banks and that the public debt capital markets affect the company's creditworthiness negatively from the rating agencies' point of view. Using an S&P corporate governance tool, the authors find common agent risk factors, such as significant blockholder ownership and CEO power, to affect the rating in a negative way. Further, Ashbaugh-Skaife et al. (2006) conclude that companies with a favorable governance structure are nearly twice as likely to obtain an investment-grade rating and, given

the relationship between credit ratings and cost of financing, companies with transparent governance can obtain debt financing with significantly better terms.

2.3 Reputational concerns of private equity firms

The study on private equity has significantly increased with the increase in sponsor activity in the market. Their role as repeat investors has intrigued academic researchers and research on the reputation effect of private equity and venture capital firms has grown to become a specific area of private equity research. Diamond (1989) was among the first to report on the role of the reputation effect in mitigating informational asymmetries between equity holders and lenders. The author concludes that, although no significant difference is observed in the short-term, a positive borrower reputation decreases financing costs significantly in the long run by alleviating conflicts of interest. Diamond (1989) also suggest that if borrowers were not concerned about their reputation, borrowers have significant interests to invest in overly risky projects. Fang (2005) confirms the findings of Diamond (1989) by observing the relationship between positive reputation and cost of financing. Further, Fang (2005) concludes that once a good reputation is earned, the cost of losing the acquired reputation becomes large, which further incentivizes maintaining of the earned reputation on the market.

Specifically on the sponsor ownership side of the research, Megginson and Weiss (1991) address the reputational concerns of venture capitalists in the IPO market and conclude that a good reputation among institutional investors is very for beneficial venture capital funds. Reputation is viewed crucial as PE investors are in the repeat business divesting their portfolio holdings and thus want to create trustworthy relationships with potential investors to ensure the sale of portfolio firm shares an IPO. Further, Megginson and Weiss (1991) suggest that the very same institutional investors also invest in venture capital firms themselves, which further highlights the importance of conducting operations in a reputable way.

Gompers (1996) makes a similar observation to Megginson and Weiss (1991) around VC-backed IPOs that venture capital companies avoid being associated with bad reputation to be able to secure a smooth IPO process for future divestments. Thus, VC investors' behavior is dictated by their reputational concerns as they aim to govern the IPO process in a way that secures their reputable position going forward. Nahata (2008) analyzes the reputation effect around IPOs further by studying the different reputational characteristics of VC companies,

such as age, cumulative market capitalization of IPOs and number of investment rounds. The author finds that cumulative market capitalization of past IPOs is the primary determinant of venture capital reputation, as VC funds with the highest cumulative market capitalization of past IPOs perform best in terms of successfully listing their subsequent portfolio companies in the future through a better market access when compared to less reputable VC companies. Thus, the finding of Nahata (2008) highlights the importance of VC funds retaining their favorable reputation to secure their market position. Using the same measure of VC reputation, Krishnan et al. (2011) find that more reputable venture capital investors are more involved in the post-IPO governance of the portfolio companies, which in turn leads to a positive long-term operational performance.

The second wave of private equity research on reputational concerns has revolved around studying the relationship between PE investors and lenders. Brav and Gompers (1997) conclude in their VC-backed IPO performance study that reputable venture capital firms have better relationships with top-tier investment and commercial banks, giving the first implications on the importance of venture capitalist reputation on debt market access. Ivanshina and Kovner (2011) further study the importance of banking relationships to private equity firms and note that PE investors with stronger bank relationships received LBO financing with significantly better loan terms, when comparing to PE investors with less established bank relationships. Thus, as solid relationships ensure private equity investors receive loan financing at a lower cost, PE firms are cautious about their reputation towards the lenders to sustain the favorable cost of financing for all future borrowing needs.

Demiroglu and James (2010) study the LBO financing market and observe several implications of a positive PE investor reputation. The authors suggest that a favorable reputation leads to better financing terms in the form of lower loan spreads and longer maturities offered to the more reputable PE firms. Further, although reputable PE investors generally tend to borrow more when loan financing is relatively cheap, the authors conclude that the observed low levels of loan spreads also result from a positive reputation significantly reducing agency costs of LBO lending.

Tyková and Borell (2012) study the bankruptcy risks of private equity-backed companies and find that PE firms generally invest in companies with better-than-average financial stability and that the portfolio companies' distress risk actually increases over the course of the PE holding

period. The authors, however, conclude that the risk does not increase above the distress risk of a comparable peer group and thus private equity ownership is not viewed to cause an increased risk of bankruptcy. Further, Tyková and Borell (2012) suggest that more reputable private equity firms are able to lower their portfolio companies' distress risk even more and thus, as a result of their reputation, they are able to secure financing with lower costs than other PE-backed companies or non-sponsor-backed firms.

In a similar study, Hotchkiss et al. (2014) analyze the default rates of PE-backed companies and have somewhat opposing results. The authors find that private equity-backed companies are actually more likely to default compared to non-PE-backed companies as a result of PE portfolio firms holding more debt on their balance sheets. However, Hotchkiss et al. (2014) suggest that when studying the group of companies with especially high leverage ratios, PE-backed companies are less likely to default than non-PE-owned companies in their peer group. This finding implies that private equity owners are more experience in mitigating the distress risk arising from significantly high leverage levels. The authors conclude that due to the proper mitigation of distress risk, private equity-backed companies are able to lever their balance sheets more relative to non-PE-backed firms without paying significantly higher spreads on their loan.

Cain et al. (2012) study the implications of private equity reputation by analyzing bid contract breaches by PE investors during the financial crisis 2007-2008. The authors find that during the financial crisis, many PE investors were forced to choose between whether to terminate or honor unprofitable contracts. As terminating financial contracts resulted in a significant reputational loss and adverse effects on future penalty clauses in their contracts, private equity firms were willing to suffer losses resulting from unprofitable contracts in the magnitude of 5-9% of their total fund value – however, after this threshold, PE companies were rather willing to take the reputational loss. Thus, Cain et al. (2012) conclude that reputation has significant economic value for private equity firms and they rather incur significant losses to protect their long-term reputation than be viewed negatively by the market.

2.4 Wealth transfers through investment and payout decisions

Investment and payout decisions are common events during a firm's financial year, but the question of whether the equity holders of a firm use investments, dividends and share

repurchases as an exploitative way to transfer wealth from bondholders has been raised by academic literature. On the investments side, Myers (1977) was the first to study the topic through the concept of underinvestment. The author argues that, rather than investing too much in too risky projects, investing too little may prove to negative affect debtholder value. Myers (1977) concludes that underinvestment around debt issues may be a sign of the firm intentionally rejecting net present value positive investments and pay out overly excessive dividends, thus transferring bondholder wealth to the shareholders of the company. On the contrary, Titman et al. (2004) and Cooper et al. (2008) find that abnormal capital expenditure and tangible asset growth, respectively, negatively affect a firm's futures stock returns due to managerial empire building. In the context of the observation's possible effects on the bondholders of a firm, Huang et al. (2016) suggest that the implication is twofold from the debtholders point of view. Bondholders benefit from the increase in cash flow and asset base if excessive investment is not funded with additional debt but, on the other hand, are worse off if additional leverage is used to finance the overinvestment.

On the payout policy side of past literature, Kalay (1982) recognizes the wealth transfer opportunities around new bond issues and underinvestment and studies the covenants set on dividend payments by bondholders to prevent limit wealth transfer possibilities. The author finds that bondholders do structure dividend payout covenants rationally, but observes that shareholders do not pay themselves the maximum amount they would be allowed to. Thus, Kalay (1982) concludes that under the dividend payout covenants, no support for wealth transfer is observed.

Maxwell ant Stephens (2003) study the wealth transfer effect from bondholders to equity holders around share repurchase announcements. The authors find that a shareholder gain around repurchases is not solely a wealth transfer from bondholders, but rather a function of wealth transfer effect and signaling effect and the dominating factor depends on whether investors view the signal as positive or negative. In the context of sponsor-ownership, Jain et al. (2009) study the payout decisions of companies after their initial public offering. The authors find that if the company was VC-backed on its IPO, the company is much more likely to prefer share repurchases to dividends as its payout method. When considering for the findings of Kalay (1982) and Maxwell and Stephens (2003), the finding of Jain et al. (2009) proves to be rather interesting, as venture capital-backed companies would implicitly prefer the payout method that partially transfers wealth form the bondholders.

A fairly recent study by Harford and Kolasinski (2014) analyzes whether private equity investors benefit from wealth transfers from debtholders. First, the authors find no evidence that the investment policy of PE-backed firms would differ from that of non-PE-sponsored companies, suggesting that excessive investment under private equity ownership is an unlikely way of transferring wealth. Second, Harford and Kolasinski (2014) observe that any payout (dividends and share repurchases) made to the private equity-owner do not result to an increased distress risk in the future. Thus, the authors also conclude that PE owners do not transfer wealth through excessive payout policies.

3. Hypotheses

As the basis of my study, I have formulated five testable hypotheses (*H1*-*H5*). The first two hypotheses (Wealth Expropriation and Reputation Acquisition) are somewhat competing in nature and focus on explaining the effects of private equity ownership in the credit metrics of companies issuing bonds or loans. The latter three hypotheses (Overinvestment, Excessive Dividend and Buyback Exit) study the first two hypotheses further by aiming to explain the use of proceeds from the bond issuance or loan withdrawal through investment and payout policies of the issuing company. This section discusses the five hypotheses in greater detail.

My first two hypotheses aim to discuss the somewhat conflicting relationship between the private equity investors and the other stakeholders of their portfolio companies. Private equity firms' main target is to maximize the value of their equity holding during their ownership period thus providing a justified return for their own investors[7]. This may lead to the PE owners acting only in their own interest and exploiting other stakeholders of the portfolio company. Thereby, with usually fairly levered balance sheets of the portfolio companies, private equity owners not only resort to creating value through company development, but also aim to create value through wealth transfers from bondholders to the equity holders. Exploitative behavior can take place in many forms, from making overly risky investments to having an excessive dividend payout policy. Thereby, with private equity owners having the sole target of maximizing the value of a portfolio company's equity, I hypothesize the following;

[7] Private equity investments are generally structured in the form of limited partnerships, where the PE firm is the general partner (GP) and their own investors, i.e. limited partners or LPs, commonly consist of other institutional investors, such as pension funds or mutual funds, along with high net worth individuals (Kaplan and Schoar, 2005).

H1 (Wealth Expropriation Hypothesis) – Private equity owners aim to maximize the value of their shareholding by transferring wealth from bondholders, thus increasing the borrowing costs of their portfolio companies.

On the contrary, private equity firms usually have investments in several companies at the same time and they thus are in the repeat business of raising debt for their portfolio companies. Should bond investors observe that a PE firm exploits the bondholders of one of its portfolio companies, investors would be likely to expect similar practices to extend to all of the portfolio companies of the given private equity owner, resulting in tighter borrowing conditions and more expensive debt. Thus, private equity firms aim to establish a reputation of a reliable borrower to secure inexpensive debt financing not only for the one portfolio company in question, but also for all future debt raisings of current and prospective portfolio firms. To secure and maintain the desired borrower reputation, private equity owners may implement governance policies in their portfolio companies that do not exploit lenders. Further, achieving low financing costs in the long run can be seen to benefit the private equity funds through the present value of savings achieved through the lower interest rates. Given the PE funds' incentive to maintain a favorable reputation, I expect to find the following;

H2 (Reputation Acquisition Hypothesis) – Private equity firms are repeat borrowers and highly concerned about their reputation in the market. To secure their market reputation, firms implement bondholder-friendly policies that lower the cost of debt for their portfolio companies.

To study the implicitly exploitative private equity ownership in greater detail, I test three further hypotheses that build on the *Wealth Expropriation Hypothesis (H1)*. These three hypotheses aim to give further understanding on the private equity owners' great power in dictating the use of the proceeds from the bond issue or loan withdrawal. When a portfolio company issues debt and receives a large sum of financing, private equity owners as large shareholders have the opportunity to establish investment policies that maximize their own benefit and thus can invest the funds in riskier projects when comparing to the non-PE-backed companies (Diamond, 1989). With the incentive to overinvest, I hypothesize the following;

H3 (Overinvestment Hypothesis) – Private equity firms as large shareholders have incentive to invest more aggressively after the bond issuance or loan withdrawal.

Further, along with having ambitious investment programs, the Private Equity owners may be tempted to use the proceeds from the debt issuance towards their own benefit by simply paying excessive dividends relative to their non-PE peers following the large capital inflow. Given the exploitative opportunity to pay out debt proceeds as additional dividends back to the PE fund, I expect to observe the following;

H4 (Excessive Dividend Hypothesis) – Private equity firms as large shareholders are likely to pay excessive dividends after the bond issuance or loan withdrawal.

Finally, although private equity investors tend to stay invested in a portfolio company even after selling a portion of their holding in the IPO, they do plan to exit their holding permanently in the medium term, usually within the next 5 years (Fürth and Rauch, 2015). Thereby, as share repurchases are one of the common exit strategies for private equity investors (Talmor and Vasvari, 2011), PE-backed companies are more likely to buy back their shares following a large influx of capital through the bond issuance or loan withdrawal.

H5 (Buyback Exit Hypothesis) – Private equity firms have incentive to permanently exit the portfolio company after an IPO and sponsor portfolio companies are thus likely to repurchase shares after the bond issuance or loan withdrawal.

4. Data and methodologies

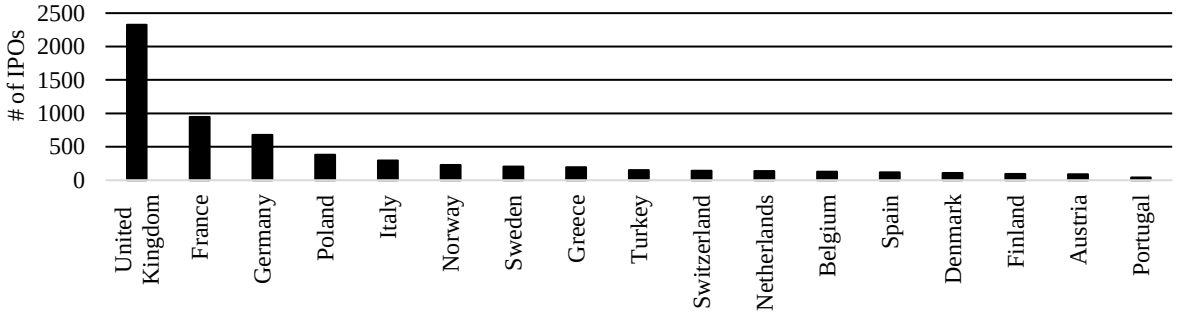
To test the presented hypotheses, I gather a Pan-European sample of bonds issued by companies that went public through an IPO between January 1, 1980 and June 30, 2014. I then run several multivariate analyses studying the post-IPO relationship between private equity sponsorship and a firm's credit metrics, investment decisions and payout policy around bond issuances and loan withdrawals. This section thoroughly explains the formulation of the final data sets, describes the different multivariate models and defines the variables used in the analysis.

4.1 Sample formation and distribution

I use the Thomson Reuters SDC Platinum Global New Issues database to identify all European companies that went public during the period between January 1, 1980 and June 30, 2014. After excluding all issuances of Depository Receipts, Certificates, Loan Stocks, Preference Shares and other forms of non-common stock, the number of European IPOs in the database over the nearly 35-year period totals to 6,480, with a significant majority of the observations occurring after 1993. For simplicity, I limit the analysis to 17 European countries with the most observations over the period (Figure 1), while the sample still accounts for 97% of the observations in the initial sample. Of the 6,256 final IPOs, 636 were backed by a private equity or venture capital sponsor. Contrary to Huang et al. (2016), I do not exclude the financial sector issuers (SIC codes 6000-6799) from the sample of IPO companies, but do include a dummy variable ($FINANCIAL\_DUM_t$) to distinguish the effects arising from the somewhat dissimilar firm characteristics.

Figure 1. Number of European companies going public during the sampling period by country

This figure presents the number of companies in the final IPO sample by country. The final IPO sample includes all 6,256 companies that went public during the period of January 1, 1980 and June 30, 2014 originating from the 17 European companies with the most observations during the selected period.



With the fully formulated IPO sample, I again use the Thomson Reuters SDC Platinum Global New Issues database to obtain my final debt capital markets sample. Initially, I am interested in all bond issues for European listed companies, or their European finance subsidiaries that issued debt to the European market during the period of January 1, 1981 and June 30, 2015 and arrive at 26,978 bonds that can be linked to a European publicly listed entity. I then exclude all variable rate, floating rate, putable, perpetual, and convertible bonds from the sample, along with all other debt-like products that differ from a traditional fixed rate bond. Further, I exclude all observations with a missing maturity, yield to maturity or proceeds amount to allow for a sufficient amount of issue-specific data for the analysis. I then manually match the bonds in the formulated debt capital markets sample with the companies in my IPO sample to determine the bonds that were issued by companies that went public through an IPO during the desired time period. A total of 3,933 bonds can be linked with 410 companies in the IPO sample.

Further, bond issues that lack company-specific fundamental data required for variable construction are excluded and credit rating data limitations force me to only include bonds issued after August 1993. Continuing to formulate the final sample, the bond issues are limited with a one-year minimum requirement since the IPO to ensure all bond offerings are matched with reliable company-specific lagged values from the year before the bond issue. Lastly, I only consider issues that fall between the first twelve years[8] since a company's IPO and exclude any offerings dated after the first twelve years since the IPO. The final debt capital markets sample

[8] Huang et al. (2016) limit the bonds to a maximum on 10 years since the IPO, but to allow for a comparably-sized sample, I extend my sample to twelve with two additional years.

consists of 1,249 bond issues by 207 individual companies. Company and issue specific lagged values are obtained from Thomson ONE and Datastream for each of the observations.

To also address the fairly bank-centered financing space of Europe, I also obtain data of 28,740 corporate loan issues by all European public companies and their European finance subsidiaries between January 1, 1981 and June 30, 2015. Similar to the debt capital markets sample, I exclude all lease, real estate, guarantee, and export credit and trade finance products from the sample as well as all other observations that differ from a traditional term loan or revolving credit facility for general corporate purposes. Further, all observations with no maturity, maximum spread or proceeds amount are excluded from the sample. As with the bond issues, the remaining 3,441 individual loan issues are manually matched with companies in the IPO sample. A total of 1,093 loans can be linked with companies in the final IPO sample. When formulating the final corporate loan sample, I also remove all observations with no company and issue-specific lagged values and limit the observations to a minimum of 1 year and a maximum of 12 years since the IPO. The abovementioned requirements force me to exclude all loan observations before May 1998 and I end up with 453 loan issues by 102 companies in the final corporate loan sample.

To better distinguish the effect of private equity ownership on the company's post-IPO governance, both the debt capital market sample and the corporate loan sample are divided into the focused [IPO+0, IPO+6] sampling period and the full [IPO+0, IPO+12] sampling period. The [IPO+0, IPO+6] sample consists of bond issues dating to a maximum of six years since the initial public offering date, by which the private involvement has usually decreased.[9] On the contrary, the [IPO+0, IPO+12] sample features all the bonds issued by the end of the 12th year since the firm's IPO. Conceptually, as private equity involvement in a portfolio company tends to diminish with time passing since the IPO, findings from the narrower sampling period are considered more meaningful. Further, as the samples feature many companies with several bond and loan issues over the sampling period, with Utilities and Financial sector companies being the most frequent issuers, clustering at the company level needs to be addressed in the analysis.

[9] Although sponsors usually sell a great portion of their holding in the IPO, Fürth and Rauch (2015) find that Private Equity funds stay invested in the firms with a smaller stake for on average 2.8 years after the IPO.

4.2 Variable definitions and descriptive statistics

4.2.1 Variable definitions

To test my two hypotheses on the effects of private equity ownership on a portfolio company's credit quality, I study the two main credit metrics available for the bond issues, i.e. credit ratings and yield spread. Credit rating model for S&P (Moody's) is presented in Section 4.3.1, with $S\&P\_RATING_t$ ($MOODY'S\_RATING_t$) as the dependent variable. Section 4.3.2 covers the yield spread and loan spread model with $YIELD\_SPREAD_t$ and $LOAN\_SPREAD_t$, respectively, as dependent variables.

Similar to Huang et al. (2016), I introduce a number of different dependent variables to test my further three hypotheses on excessive investment and payout policies. For the investment policy models presented in Section 4.4.1, I use three alternative investment measures as the dependent variable ($CAPEX/TANG_{t,t+2}$, $CAPEX/AT_{t,t+2}$ and $(CAPEX+RD)/AT_{t,t+2}$)[10]. Similarly, for the dividend policy models discussed in Section 4.4.2, I analyze the model with four different dependent variables ($DIV\_PAYER\_DUM_{t,t+2}$, $DIV\_PAYOUT_{t,t+2}$, $DIV\_YIELD_{t,t+2}$ and $DIV/ASSETS_{t,t+2}$). Finally, for the share repurchase models presented in Section 4.4.3, I analyze the model with three dependent variables ($SHARE\_REPUR\_DUM_{t,t+2}$, $SHARE\_REPUR_{t,t+2}$ and $SHARE\_REPUR/ASSETS_{t,t+2}$), all of which derive their logic from the dividend policy model variables.

To control for the macro environment and for the industry, company and issue-specific factors, I introduce a number of independent variables presented and described in Table 1. An especial interest throughout the analysis is put on the private equity-backed IPO dummy variable (PE_DUM_t), as the coefficient of this variable will help explain the effect of private equity ownership on the credit rating of a portfolio company's bond (loan), bond yield (loan spread) and the use of bond (loan) proceeds in investments, dividend payouts and share buybacks post-IPO.

[10] $AT_{t,t+2}$ used in the three alternative investment measures refers to the total asset of the company at the beginning of the financial year.

Table 1. Definitions of dependent and independent variables

This table presents and defines the dependent and independent variables used in the multivariate analyses of this thesis and cites the main source of the variable itself or its inputs. Any references to the to the bond issue date (year) refer to the loan announcement date (year) in the context of the European corporate loan sample, if applicable. All monetary variables in the sample are reported in USD.

Variable	Definition	Source
	Panel A: Dependent Variables	
$S\&P\_RATING_t$	S&P credit rating of the bond/loan taking values between 1 and 19, where 1 equals to CCC- and 19 to AAA.	SDC Platinum
$MOODY'S\_RATING_t$	Moody's credit rating of the bond/loan taking values between 1 and 19, where 1 equals to Caa3 and 19 to Aaa.	SDC Platinum
$YIELD\_SPREAD_t$	Difference of a bond's basis point yield-to-maturity and yield on a similar maturity sovereign bond[11] of the country where the issuing firm is listed.	SDC Platinum Datastream
$LOAN\_SPREAD_t$	Difference of a loan's maximum basis point spread and its reference rate (EURIBOR or LIBOR) on the loan announcement date.	SDC Platinum Datastream
$CAPEX/TANG_{t,t+2}$	Three-year average (bond issue year *t* and two preceding financial years *t+1, t+2*) capital expenditure divided by the net tangible assets at the beginning of the bond issue year.	Thomson ONE
$CAPEX/AT_{t,t+2}$	Three-year average (bond issue year *t* and two preceding financial years *t+1, t+2*) capital expenditure divided by the total assets at the beginning of the bond issue year.	Thomson ONE
$(CAPEX+RD)/AT_{t,t+2}$	Three-year average (bond issue year *t* and two preceding financial years *t+1, t+2*) of the sum of capital expenditure and R&D investments divided by the total assets at the beginning of the bond issue year.	Thomson ONE
$DIV\_PAYER\_DUM_{t,t+2}$	Dummy variable taking the value 1 if the issuer has paid a dividend in at least one of the three years (bond issue year *t* and two preceding financial years *t+1, t+2*) and 0 otherwise.	Thomson ONE
$DIV\_PAYOUT_{t,t+2}$	Three-year average (bond issue year *t* and two preceding financial years *t+1, t+2*) of common dividend divided by end-of-year income before extraordinary items.	Thomson ONE
$DIV\_YIELD_{t,t+2}$	Three-year average (bond issue year *t* and two preceding financial years *t+1, t+2*) of dividend per share divided by end-of-year share price in a given year.	Thomson ONE
$DIV/ASSETS_{t,t+2}$	Three-year average (bond issue year *t* and two preceding financial years *t+1, t+2*) of common dividend divided by the total assets at the beginning of the bond issue year.	Thomson ONE
$SHARE\_REPUR\_DUM_{t,t+2}$	Dummy variable taking the value 1 if the issuer has bought back shares in at least one of the three years (bond issue year *t* and two preceding financial years *t+1, t+2*) and 0 otherwise.	Thomson ONE
$SHARE\_REPUR_{t,t+2}$	Three-year average (bond issue year *t* and two preceding financial years *t+1, t+2*) of share repurchases divided by end-of-year income before extraordinary items.	Thomson ONE
$SHARE\_REPUR/ASSETS_{t,t+2}$	Three-year average (bond issue year *t* and two preceding financial years *t+1, t+2*) of share repurchases divided by the total assets at the beginning of the bond issue year.	Thomson ONE
	Panel B: Independent Variables	
PE_DUM_t	Dummy variable taking the value 1 when the bond/loan issuer's IPO was backed by a private equity or venture capital sponsor and 0 otherwise.	SDC Platinum

[11] Similar maturities of sovereign bonds are defined in the following way: 1-yr treasury if $MATURITY_t \leq 1.5$ yrs., 2-yr treasury if 1.5 yrs. < $MATURITY_t \leq 2.5$ yrs., 3-yr treasury if 2.5 yrs. < $MATURITY_t \leq 4.0$ yrs., 5-yr treasury if 4.0 yrs. < $MATURITY_t \leq 6.0$ yrs., 7-yr treasury if 6.0 yrs. < $MATURITY_t \leq 8.5$ yrs., 10-yr treasury if 8.5 yrs. < $MATURITY_t \leq 20.0$ yrs. and 30-yr treasury if 20 yrs. < $MATURITY_t$, where $MATURITY_t$ is the maturity of the bond in years.

Variable	Definition	Source
	Panel B: Independent Variables (continuing)	
$DEFAULT\_SPREAD_t$	Basis point yield difference of European Moody's rated Baa and Aaa bonds of a similar maturity.	Datastream
$PROCEEDS_t$	Gross proceeds (in billions) from the bond/loan issue.	SDC Platinum
$MATURITY_t$	Number of years between the bond's (loan's) final maturity date and issue (announcement) date.	SDC Platinum
$EXTENDABLE\_DUM_t$	Dummy variable taking the value 1 when the loan's final maturity date is extendable by additional time and 0 otherwise.	SDC Platinum
$REVOLVER\_DUM_t$	Dummy variable taking the value 1 when the loan is a revolving credit facility and 0 otherwise.	SDC Platinum
$SUBORD\_DUM_t$	Dummy variable taking the value 1 when the bond/loan is subordinated and 0 otherwise.	SDC Platinum
$FIRST\_BOND\_DUM_t$	Dummy variable taking the value 1 when the bond is the first bond issued by the company and 0 otherwise.	SDC Platinum
$FIRST\_LOAN\_DUM_t$	Dummy variable taking the value 1 when the loan is the first loans issued by the company and 0 otherwise.	SDC Platinum
$TOTAL\_BONDS_t$	Number of bonds issued by the firm prior to the bond issue date. Includes the current one and any similar issuances before the IPO.	SDC Platinum
$TOTAL\_LOANS_t$	Number of loans issued by the firm prior to the loan announcement date. Includes the current one and any similar issuances before the IPO.	SDC Platinum
M_CAP_{t-1}	Market value of equity of the issuer in billions at the end of the full financial before the bond issue year.	Thomson ONE
AGE_t	Number of years between the bond's issue date and the company's founding date.	SDC Platinum Thomson ONE
ROA_{t-1}	Net income of the issuer at divided by the total assets at the end of the full financial before the bond issue year.	Thomson ONE
$LOSS\_DUM_{t-1}$	Dummy variable taking the value 1 if the company's net income was negative during the full financial year before the bond issue and 0 otherwise.	Thomson ONE
$ICR_{0,t-1}$	Interest coverage ratio variable calculated by dividing operating income with total interest expense for the full financial before the bond issue year, taking values by the ICR grid.	Thomson ONE
$ICR_{5,t-1}$	Interest coverage ratio variable taking values by the ICR grid.	Thomson ONE
$ICR_{10,t-1}$	Interest coverage ratio variable taking values by the ICR grid.	Thomson ONE
$ICR_{20,t-1}$	Interest coverage ratio variable taking values by the ICR grid.	Thomson ONE
$LEVERAGE_{t-1}$	Book value of total debt divided by total assets at the end of the full financial before the bond issue year.	Thomson ONE
$MARKET\_TO\_BOOK_{t-1}$	Sum of market value of equity and book value of debt divided by total assets at the end of the full financial before the bond issue year.	Thomson ONE
$TANGIBILITY_{t-1}$	Net property, plant & equipment in the beginning of the bond issue year divided by the opening value of total assets.	Thomson ONE
$UTILITY\_DUM_t$	Dummy variable taking the value 1 if the issuing company is a regulated Utility, Transport or Communications firm (SIC codes 4000-4949) and 0 otherwise.	SDC Platinum
$FINANCIAL\_DUM_t$	Dummy variable taking the value 1 if the issuing company is a Financial entity (SIC codes 6000-6799) and 0 otherwise.	SDC Platinum
$SOVEREIGN\_RATING_t$	S&P (Moody's) sovereign credit rating of the country where the issuing firm is listed taking values between 1 and 19, where 1 equals to CCC- (Caa3) and 19 to AAA (Aaa).	SDC Platinum
NET_DEBT_t	Defined as the change in the book value of debt of the issuing firm over the bond issue year divided by the opening value of total assets.	Thomson ONE
$SUBSIDIARY\_DUM_t$	Dummy variable taking the value 1 when the bond/loan issuing entity is a finance subsidiary of the parent and 0 otherwise.	SDC Platinum
$RETURN_t$	Difference of the buy-and-hold return of the bond issuer's stock and the buy-and-hold return of a pan-European market index during a 1-year period before the bond issue date.	Thomson ONE
$CAPEX/TANG_{t-1}$	Capital expenditure divided by the net tangible assets during the full financial year before the bond issue.	Thomson ONE
$CAPEX/AT_{t-1}$	Capital expenditure divided by the total assets during the full financial year before the bond issue.	Thomson ONE

Variable	Definition	Source
	Panel B: Independent Variables (continuing)	
$(CAPEX+RD)/AT_{t-1}$	Sum of capital expenditure and R&D investments divided by the total assets during the full financial year before the bond issue.	Thomson ONE
$DIV\_PAYER\_DUM_{t-1}$	Dummy variable taking the value 1 if the company paid a dividend during the full financial year before the bond issue and 0 otherwise.	Thomson ONE
DIV_PAYOUT_{t-1}	Common dividend during the full financial year before the bond issue divided by end-of-year income before extraordinary items.	Thomson ONE
DIV_YIELD_{t-1}	Dividend per share during the full financial year before the bond issue divided by end-of-year share price.	Thomson ONE
$DIV/ASSETS_{t-1}$	Common dividend during the full financial year divided by the total assets at the beginning of the bond issue year.	Thomson ONE
$SHARE\_REPUR\_DUM_{t-1}$	Dummy variable taking the value 1 if the company repurchased shares during the full financial year before the bond issue and 0 otherwise.	Thomson ONE
$SHARE\_REPUR_{t-1}$	Share repurchases during the full financial year before the bond issue divided by end-of-year income before extraordinary items.	Thomson ONE
$SHARE\_REPUR/ASSETS_{t-1}$	Share repurchases during the full financial year before the bond issue divided by the total assets at the beginning of the bond issue year.	Thomson ONE
$BOND\_PEDIOD\_DUM_{2001,2007}$ $(LOAN\_PEDIOD\_DUM_{2001,2007})$	Dummy variable taking the value 1 if the bond was issued (loan was announced) between 2001-2007 and 0 otherwise.	SDC Platinum
$BOND\_PEDIOD\_DUM_{2008,2012}$ $(LOAN\_PEDIOD\_DUM_{2008,2012})$	Dummy variable taking the value 1 if the bond was issued (loan was announced) between 2008-2012 and 0 otherwise.	SDC Platinum
$BOND\_PEDIOD\_DUM_{2013,2015}$ $(LOAN\_PEDIOD\_DUM_{2013,2015})$	Dummy variable taking the value 1 if the bond was issued (loan was announced) between 2013-2015 and 0 otherwise.	SDC Platinum
$IPO\_PERIOD\_DUM_{1999\text{-}2000}$	Dummy variable taking the value 1 if issuer's IPO occurred between 1999-2000 and 0 otherwise.	SDC Platinum
$IPO\_PERIOD\_DUM_{2001\text{-}2007}$	Dummy variable taking the value 1 if issuer's IPO occurred between 2001-2007 and 0 otherwise.	SDC Platinum
$IPO\_PERIOD\_DUM_{2008\text{-}2012}$	Dummy variable taking the value 1 if issuer's IPO occurred between 2008-2012 and 0 otherwise	SDC Platinum
$IPO\_PERIOD\_DUM_{2013\text{-}2014}$	Dummy variable taking the value 1 if issuer's IPO occurred between 2013-2014 and 0 otherwise	SDC Platinum
$COUNTRY\_DUMMIES_t$	Dummy variables for each European country in the sample (except for the United Kingdom) taking the value 1 if issuer is incorporated in that given country and 0 otherwise.	SDC Platinum Thomson ONE

Control variables were chosen to reflect prior literature (e.g. Harford and Kolasinski, 2014; Huang et al., 2016) with two additional variables that better account for the analysis of the corporate loan sample (i.e. $EXTENDABLE\_DUM_t$ and $REVOLVER\_DUM_t$). Further, to better account for the country-specific differences in Europe, I introduce the $SOVEREIGN\_RATING_t$ variable, which controls for the country specific variation in credit ratings[12]. In line with Huang et al. (2016), to account for the nonlinear effect of the interest coverage ratio (ICR) on both credit ratings and yield and loan spreads, I introduce the interest coverage ratio variables as first introduced by Ashbaugh-Skeife et al. (2006). ICR_{t-1} is calculated by dividing the operating income with the total interest expense of the issuer for the full financial before the bond issue year and the $_{-1}$ variables ($ICR_{0,t-1}$, $ICR_{5,t-1}$, $ICR_{10,t-1}$ and $ICR_{20,t-1}$) take values according to the

[12] Country-specific variation is also controlled in the yield and loan spread analysis by using sovereign bond yields as the benchmark for yield spreads and EURIBOR and LIBOR rates as the benchmark for loan spreads.

ICR grid below. All of the four variables get the value 0 if ICR_{t-1} is negative and the value 100 if ICR_{t-1} is greater than 100.

ICR Grid	$ICR_{0,t-1}$	$ICR_{5,t-1}$	$ICR_{10,t-1}$	$ICR_{20,t-1}$
$0 \leq ICR_{t-1} < 5$	ICR_{t-1}	0	0	0
$0 \leq ICR_{t-1} < 5$	5	ICR_{t-1} - 5	0	0
$0 \leq ICR_{t-1} < 5$	5	5	ICR_{t-1} - 10	0
$0 \leq ICR_{t-1} < 5$	5	5	10	ICR_{t-1} - 20

4.2.2 Descriptive statistics for [IPO+0, IPO+6] sampling period

For brevity, descriptive statistics for the full [IPO+0, IPO+12] sampling period for both the debt capital markets and corporate debt data sets are reported in Table 13 in Appendix A. By looking at the descriptive statistics for the focused [IPO+0, IPO+6] sampling period presented in Table 2 (Panel A), I note that the mean and median credit ratings of PE-sponsored firms for both S&P and Moody's are observably lower than the ratings of the non-PE-backed companies. A similar observation holds in the case of yield and loan spreads, as the mean and median for both is noticeably higher for PE-backed companies when compared to the non-PE-backed firms of the sample. Other mentionable observations from the means and medians of the sample (Panel B) include that the sponsor-backed firms are more levered and smaller in terms of market capitalization when compared to the non-PE-backed companies. Further, sponsor-backed companies issue larger debt instruments, however, with maturities similar maturities, and are observably younger than their non-sponsor-backed peer companies are. Also, the stock returns of PE-backed and non-PE-backed firms are in the same range over a one-year period before the bond issue date.

When solely comparing the PE-backed firms in the debt capital markets sample and corporate loan sample, I find that the raised loan amounts are larger than the financing raised through bonds and maturities on withdrawn loans are shorter than on issued bonds, with companies taking loan financing also being slightly older than the firms issuing bonds are. Additionally, the PE-backed firms in the corporate loan sample are larger than the firms in the debt capital markets sample in terms of market capitalization and PE-backed companies withdrawing loans are more likely to make a loss than the bond issuing PE-backed firms are.

Table 2. Descriptive statistics for post-IPO bond issuances and loan withdrawals – [IPO+0, IPO+6]

This table presents the sample sizes, medians and means of both the dependent variables (Panel A) and independent variables (Panel B) used in this study. The table shows statistics for both the final debt capital markets sample and the final corporate loan sample in the narrower [IPO+0, IPO+6] sampling period that cover all bonds and loans issued between immediately after and a maximum of 6 years since a given firm's initial public offering date. For both samples, the statistics are reported separately for the PE-backed IPOs (i.e. PE_DUM_t taking the value 1) and for all the IPOs in a given sample (i.e. PE_DUM_t taking either the value 0 or 1). PE_DUM_t is the private equity dummy variable taking the value 1 if the bond issuer was backed by a private equity or venture capital sponsor on its initial public offering and taking the value 0 otherwise. For brevity, statistics for the bond period dummy variables ($BOND\_PERIOD\_DUM_i$), loan period dummy variables ($LOAN\_PERIOD\_DUM_i$), IPO period dummy variables ($IPO\_PERIOD\_DUM_i$) and country-specific dummy variables ($COUNTRY\_DUM_i$) are not reported in the table.

Panel A

Sample	Debt Capital Markets [IPO+0, IPO+6]				Corporate Loan [IPO+0, IPO+6]			
Subsample	*PE-Backed IPOs*		*All IPOs*		*PE-Backed IPOs*		*All IPOs*	
n	*61*		*486*		*46*		*192*	
Dependent Variables	Median	Mean	Median	Mean	Median	Mean	Median	Mean
$S\&P\_RATING_t$	8.000	9.830	14.000	13.429	8.000	8.295	11.000	10.672
$MOODY'S\_RATING_t$	7.000	8.811	15.000	14.145	8.000	7.750	11.000	10.724
$YIELD\_SPREAD_t$	317.600	272.621	70.875	101.318				
$LOAN\_SPREAD_t$					100.000	151.196	85.000	125.348
$CAPEX/TANG_{t,t+2}$	0.210	38.720	11.076	53.631	-9.029	122.931	12.969	144.013
$CAPEX/AT_{t,t+2}$	3.858	4.979	4.151	5.266	5.493	6.210	6.184	7.538
$(CAPEX+RD)/AT_{t,t+2}$	4.603	5.444	4.492	5.611	5.831	6.729	6.508	8.008
$DIV\_PAYER\_DUM_{t,t+2}$	1.000	0.885	1.000	0.712	1.000	0.957	1.000	0.943
$DIV\_PAYOUT_{t,t+2}$	34.339	40.464	27.826	39.765	34.366	30.509	34.953	117.484
$DIV\_YIELD_{t,t+2}$	1.904	2.459	3.008	4.319	2.066	3.982	2.674	3.656
$DIV/ASSETS_{t,t+2}$	1.362	1.853	0.552	1.340	2.748	2.515	1.644	2.797
$SHARE\_REPUR\_DUM_{t,t+2}$	0.000	0.164	0.000	0.160	0.000	0.391	0.000	0.297
$SHARE\_REPUR_{t,t+2}$	0.000	10.946	0.000	4.789	0.000	4.365	0.000	4.627
$SHARE\_REPUR/ASSETS_{t,t+2}$	0.000	0.730	0.000	0.282	0.000	0.228	0.000	0.295

Table 2. (Continuing)

Panel B

Sample	Debt Capital Markets [IPO+0, IPO+6]				Corporate Loan [IPO+0, IPO+6]			
Subsample	*PE-Backed IPOs*		*All IPOs*		*PE-Backed IPOs*		*All IPOs*	
n	*61*		*486*		*46*		*192*	
Independent Variables	Median	Mean	Median	Mean	Median	Mean	Median	Mean
PE_DUM_{t}	1.000	1.000	0.000	0.126	1.000	1.000	0.000	0.240
$DEFAULT\_SPREAD_{t}$	95.400	100.389	101.600	123.146				
$PROCEEDS_{t}$	0.503	1.381	0.330	0.788	0.702	0.994	0.691	1.641
$MATURITY_{t}$	7.058	9.324	7.064	8.708	5.003	4.300	4.638	3.781
$EXTENDABLE\_DUM_{t}$					0.000	0.043	0.000	0.120
$REVOLVER\_DUM_{t}$					0.000	0.435	1.000	0.521
$SUBORD\_DUM_{t}$	0.000	0.033	0.000	0.074	0.000	0.000	0.000	0.016
$FIRST\_BOND\_DUM_{t}$	0.000	0.393	0.000	0.204				
$FIRST\_LOAN\_DUM_{t}$					0.000	0.217	0.000	0.234
$TOTAL\_BONDS_{t}$	2.000	2.951	5.000	17.951				
$TOTAL\_LOANS_{t}$					4.500	9.261	3.000	7.740
M_CAP_{t-1}	3.778	4.177	9.507	30.384	5.219	4.611	6.224	21.696
AGE_{t}	8.485	21.778	26.074	37.256	9.723	34.032	10.014	23.043
ROA_{t-1}	0.023	0.023	0.017	0.023	0.037	0.031	0.037	0.039
$LOSS\_DUM_{t-1}$	0.000	0.148	0.000	0.105	0.000	0.283	0.000	0.151
$ICR_{0,t-1}$	3.118	2.942	2.364	2.883	3.538	3.365	3.156	4.060
$ICR_{5,t-1}$	0.000	1.056	0.000	1.346	0.000	0.711	0.000	1.762
$ICR_{10,t-1}$	0.000	0.374	0.000	1.286	0.000	0.164	0.000	1.550
$ICR_{20,t-1}$	0.000	0.224	0.000	1.652	0.000	0.000	0.000	2.485
$LEVERAGE_{t-1}$	0.302	0.408	0.235	0.273	0.397	0.511	0.343	0.386
$MARKET\_TO\_BOOK_{t-1}$	1.046	1.290	0.684	0.899	1.413	1.641	1.230	1.452
$TANGIBILITY_{t-1}$	-0.038	-0.024	0.061	0.107	-0.213	-0.233	0.110	0.043
$UTILITY\_DUM_{t}$	0.000	0.000	0.000	0.173	0.000	0.000	0.000	0.172
$FINANCIAL\_DUM_{t}$	0.000	0.197	0.000	0.418	0.000	0.022	0.000	0.104
$SOVEREIGN\_RATING_{t}$	19.000	18.475	19.000	18.510	19.000	18.717	19.000	17.536
NET_DEBT_{t}	-0.018	0.038	0.012	0.060	0.012	0.082	0.026	0.077
$SUBSIDIARY\_DUM_{t}$	0.000	0.246	0.000	0.031	0.000	0.000	0.000	0.021
$RETURN_{t}$	0.094	0.099	0.093	0.094	0.140	0.073	0.044	0.055
$CAPEX/TANG_{t-1}$	-4.329	-24.681	10.054	65.441	-3.942	-7.627	10.728	150.131
$CAPEX/AT_{t-1}$	3.129	4.878	3.882	6.841	3.500	6.071	5.954	7.268
$(CAPEX+RD)/AT_{t-1}$	4.195	5.390	4.214	7.437	6.619	6.661	6.152	7.719
$DIV\_PAYER\_DUM_{t-1}$	1.000	0.541	1.000	0.599	0.000	0.196	0.000	0.490
DIV_PAYOUT_{t-1}	0.000	32.544	20.595	30.265	0.000	33.320	0.000	-16.306
DIV_YIELD_{t-1}	1.494	2.259	2.372	2.820	1.931	1.743	1.945	2.395
$DIV/ASSETS_{t-1}$	0.001	0.750	0.231	1.123	0.000	3.311	0.000	5.012
$SHARE\_REPUR\_DUM_{t-1}$	0.000	0.066	0.000	0.097	0.000	0.370	0.000	0.172
$SHARE\_REPUR_{t-1}$	0.000	0.711	0.000	2.764	0.000	3.117	0.000	2.841
$SHARE\_REPUR/ASSETS_{t-1}$	0.000	0.053	0.000	0.255	0.000	0.225	0.000	0.216

4.3 Methods analyzing the effect of private equity on credit quality

4.3.1 Credit ratings

Credit rating agencies hold vast amounts of non-public information on the companies they analyze along with public information available to all. Thus, the informational content of the rating opinions can help understand the possibly exploitative nature of private equity ownership. In the context of the *Wealth Expropriation Hypothesis*, rating agencies would observe exploitative qualities in PE-backed firms' governance that suggest a lower credit rating. Alternatively, if the *Reputation Acquisition Hypothesis* holds, rating agencies take note of the bondholder-friendly practices resulting from the private equity owners' reputational concerns and award the PE-backed firms with higher credit ratings.

To analyze the effect of private equity ownership in a portfolio company's bond rating, I estimate Model 1 for S&P (Moody's) ratings using $S\&P\_RATING_t$ ($MOODY'S\_RATING_t$) as the dependent variable and the specified independent variables.

(1)

$$
\begin{aligned}
S\&P\ RATING_t(MOODY'S\ RATING_t) &= \beta_0 + \beta_1 PE\ DUM_t + \beta_2 PROCEEDS_t + \beta_3 MATURITY_t + \beta_4 SUBORD\ DUM_t \\
&+ \beta_5 FIRST\ BOND\ DUM_t + \beta_6 TOTAL\ BONDS_t + \beta_7 M\ CAP_{t-1} + \beta_8 AGE_t \\
&+ \beta_9 DIV\ PAYER\ DUM_{t-1} + \beta_{10} SHARE\ REP\ DUM_{t-1} + \beta_{11} ROA_{t-1} + \beta_{12} LOSS\ DUM_{t-1} \\
&+ \beta_{13} ICR_{0,t-1} + \beta_{14} ICR_{5,t-1} + \beta_{15} ICR_{10,t-1} + \beta_{16} ICR_{20,t-1} + \beta_{17} LEVERAGE_{t-1} \\
&+ \beta_{18} MARKET\ TO\ BOOK_{t-1} + \beta_{19} TANGIBILITY_{t-1} + \beta_{20} UTILITY\ DUM_t \\
&+ \beta_{21} FINANCIAL\ DUM_t + \beta_{22} SOVEREIGN\ RATING_t + \beta_{23} NET\ DEBT_t \\
&+ \beta_{24} SUBSIDIARY\ DUM_t + \beta_{25} RETURN_t + \sum_{k=26}^{28} \beta_k\ BOND\ PERIOD\ DUM_i \\
&+ \sum_{k=29}^{32} \beta_k\ IPO\ PERIOD\ DUM_i + \sum_{k=33}^{47} \beta_k\ COUNTRY\ DUM_i
\end{aligned}
$$

The slightly adjusted Model 2 amends the previous model to fit the corporate loan sample with the introduction of two loan market-specific variables (*EXTENDABLE DUM_t REVOLVER DUM_t*). Both Models 1 and 2 are estimated for S&P and Moody's credit ratings.

(2)

$$S\&P\ RATING_t(MOODY'S\ RATING_t) = \beta_0 + \beta_1 PE\ DUM_t + \beta_2 PROCEEDS_t + \beta_3 MATURITY_t + \beta_4 EXTENDABLE\ DUM_t + \beta_5 REVOLVER\ DUM_t + \beta_6 SUBORD\ DUM_t + \beta_7 FIRST\ LOAN\ DUM_t + \beta_8 TOTAL\ LOANS_t + \beta_9 M\ CAP_{t-1} + \beta_{10} AGE_t + \beta_{11} DIV\ PAYER\ DUM_{t-1} + \beta_{12} SHARE\ REP\ DUM_{t-1} + \beta_{13} ROA_{t-1} + \beta_{14} LOSS\ DUM_{t-1} + \beta_{15} ICR_{0,t-1} + \beta_{16} ICR_{5,t-1} + \beta_{17} ICR_{10,t-1} + \beta_{18} ICR_{20,t-1} + \beta_{19} LEVERAGE_{t-1} + \beta_{20} MARKET\ TO\ BOOK_{t-1} + \beta_{21} TANGIBILITY_{t-1} + \beta_{22} UTILITY\ DUM_t + \beta_{23} FINANCIAL\ DUM_t + \beta_{24} SOVEREIGN\ RATING_t + \beta_{25} NET\ DEBT_t + \beta_{26} SUBSIDIARY\ DUM_t + \beta_{27} RETURN_t \sum_{k=28}^{30} \beta_k\ LOAN\ PERIOD\ DUM_i + \sum_{k=31}^{34} \beta_k\ IPO\ PERIOD\ DUM_i + \sum_{k=35}^{50} \beta_k\ COUNTRY\ DUM_i$$

4.3.2 Bond yields and loan spreads

Bond yield spreads and loan spreads hold information on the borrower's creditworthiness from the lender's point of view. Generally, the information portrayed by bond spreads is solely based on public sources, aside from the non-public information affecting the publicly available credit rating. Thus, in the context of private equity ownership, bonds spreads offer the market's view of the portfolio company's governance structures and creditworthiness. However, in the case of loan spreads, banks and other private lenders often have access to non-public information (Hale and Santos, 2009). This can possibly result in somewhat different implications on the effect of private equity ownership on a portfolio company's cost of debt, when compared to decisions made solely based on publicly available information. If the *Wealth Expropriation Hypothesis* holds, bond market investors and private lenders have observed the private equity owner to exploit other stakeholders of the issuing firm, causing them to demand higher yields on the portfolio company's debt. Alternatively, debtholder-friendly governance structures would be rewarded with lower borrowing costs under the *Reputation Acquisition Hypothesi*s.

To study the effect of private equity ownership in a portfolio company's bond yield spreads, I estimate Model 3 using $YIELD\_SPREAD_t$ as the dependent variable and a variation of the specified independent variables.

(3)

$$
\begin{aligned}
YIELD\ SPREAD_t = {} & \beta_0 + \beta_1 PE\ DUM_t + \beta_2 DEFAULT\ SPREAD_t + \beta_3 PROCEEDS_t + \beta_4 MATURITY_t \\
& + \beta_5 SUBORD\ DUM_t + \beta_6\ FIRST\ BOND\ DUM_t + \beta_7 TOTAL\ BONDS_t + \beta_8 M\ CAP_{t-1} \\
& + \beta_9 AGE_t + \beta_{10} DIV\ PAYER\ DUM_{t-1} + \beta_{11} SHARE\ REP\ DUM_{t-1} + \beta_{12} ROA_{t-1} \\
& + \beta_{13} LOSS\ DUM_{t-1} + \beta_{14} ICR_{0,t-1} + \beta_{15} ICR_{5,t-1} + \beta_{16} ICR_{10,t-1} + \beta_{17} ICR_{20,t-1} \\
& + \beta_{18} LEVERAGE_{t-1} + \beta_{19} MARKET\ TO\ BOOK_{t-1} + \beta_{20} TANGIBILITY_{t-1} \\
& + \beta_{21} UTILITY\ DUM_t + \beta_{22} FINANCIAL\ DUM_t + \beta_{23} SOVEREIGN\ RATING_t \\
& + \beta_{24} NET\ DEBT_{t-1} + \beta_{25} SUBSIDIARY\ DUM_t + \beta_{26} RETURN_t \\
& + \sum_{k=27}^{29} \beta_k\ BOND\ PERIOD\ DUM_i + \sum_{k=30}^{33} \beta_k\ IPO\ PERIOD\ DUM_i + \sum_{k=34}^{48} \beta_k\ COUNTRY\ DUM_i \\
& + \beta_{49} S\&P\ RATING_t\ + \beta_{50} MOODY'S RATING_t
\end{aligned}
$$

The slightly adjusted Model 4 amends the previous model to fit the corporate loan sample by using ($LOAN\_SPREAD_t$) as the dependent variable and introducing the loan market-specific variables to the list of independent variables.

(4)

$$
\begin{aligned}
LOAN\ SPREAD_t = {} & \beta_0 + \beta_1 PE\ DUM_t + \beta_2 PROCEEDS_t + \beta_3 MATURITY_t + \beta_4 EXTENDABLE\ DUM_t \\
& + \beta_5 REVOLVER\ DUM_t + \beta_6 SUBORD\ DUM_t + \beta_7\ FIRST\ LOAN\ DUM_t \\
& + \beta_8 TOTAL\ LOANS_t + \beta_9 M\ CAP_{t-1} + \beta_{10} AGE_t + \beta_{11} DIV\ PAYER\ DUM_{t-1} \\
& + \beta_{12} SHARE\ REP\ DUM_{t-1} + \beta_{13} ROA_{t-1} + \beta_{14} LOSS\ DUM_{t-1} + \beta_{15} ICR_{0,t-1} + \beta_{16} ICR_{5,t-1} \\
& + \beta_{17} ICR_{10,t-1} + \beta_{18} ICR_{20,t-1} + \beta_{19} LEVERAGE_{t-1} + \beta_{20} MARKET\ TO\ BOOK_{t-1} \\
& + \beta_{21} TANGIBILITY_{t-1} + \beta_{22} UTILITY\ DUM_t + \beta_{23} FINANCIAL\ DUM_t \\
& + \beta_{24} SOVEREIGN\ RATING_t + \beta_{25} NET\ DEBT_{t-1} + \beta_{26} SUBSIDIARY\ DUM_t \\
& + \beta_{27} RETURN_t + \sum_{k=28}^{30} \beta_k\ LOAN\ PERIOD\ DUM_i + \sum_{k=31}^{34} \beta_k\ IPO\ PERIOD\ DUM_i \\
& + \sum_{k=35}^{50} \beta_k\ COUNTRY\ DUM_i + \beta_{51} S\&P\ RATING_t\ + \beta_{52} MOODY'S RATING_t
\end{aligned}
$$

Both Models 3 & 4 are first estimated without controlling for variation resulting from the credit rating of the bond or loan, followed by a specification that introduces the credit rating variables presented in Section 4.3.1. The second specification was chosen to better account for the implicit relationship between a higher credit rating and lower borrowing costs, which can be considered as a reward for better creditworthiness. Thus, the latter specification, which accounts for the informational content of credit ratings, better highlights the true effect of private equity ownership on a portfolio company's cost of debt.

4.4 Methods studying PE sponsorship's effect on investment and payout policies

4.4.1 Investment policies

To determine, whether private equity-owned companies resort to excessive investments and thus exploit their debtholders, the analysis is complemented by studying three different investment ratios over the three years following a bond issuance or loan withdrawal. If the *Overinvestment Hypothesis* holds and private equity-backed firms resort to bondholder value destroying investments to benefit their PE owner, PE-sponsored companies should record higher investment ratios than their non-PE-backed peer companies. The three dependent variables used in the analysis are consistent with prior literature, with a company's capital expenditure relative to its tangible assets ($CAPEX/TANG_{t,t+2}$) being the most widely used (e.g. Polk and Sapienza, 2008; Huang et al., 2016). Further, to allow for consistency with the US-based Huang et al. (2016) study, I also introduce the ratios accounting for capital expenditure and total investment (capital and R&D) relative the firms total assets ($CAPEX/AT_{t,t+2}$ and $(CAPEX+RD)/AT_{t,t+2}$), that were first introduced by Agrawal and Nasser (2012) and Anderson et al. (2012).

To study whether private equity-backed companies' use of bond or loan proceeds for investment purposes differs from the non-PE-backed firms, I estimate Model 5 using the three alternative dependent variables $CAPEX/TANG_{t,t+2}$, $CAPEX/AT_{t,t+2}$ and $(CAPEX+RD)/AT_{t,t+2}$ and the independent variables laid out in Model 5. The same model and set of variables specified for the loan market is also used when analyzing the effect of PE ownership effect on companies' investment policies in the corporate loan sample.

(5)

$$
\begin{aligned}
CAPEX\ TANG_{t,t+2} &= \beta_0 + \beta_1 PE\ DUM_t + \beta_2 TANGIBILITY_{t-1} + \beta_3 M\ CAP_{t-1} + \beta_4 AGE_t \\
&+ \beta_5 DIV\ PAYER\ DUM_{t-1} + \beta_6 SHARE\ REP\ DUM_{t-1} + \beta_7 ROA_{t-1} + \beta_8 LOSS\ DUM_{t-1} \\
&+ \beta_9 LEVERAGE_{t-1} + \beta_{10} MARKET\ TO\ BOOK_{t-1} + \beta_{11} UTILITY\ DUM_t \\
&+ \beta_{12} FINANCIAL\ DUM_t + \beta_{13} SUBSIDIARY\ DUM_t + \beta_{14} CAPEX\ TANG_{t-1} \\
&+ \sum_{k=15}^{17} \beta_k\ BOND\ (LOAN)\ PERIOD\ DUM_i + \sum_{k=18}^{21} \beta_k\ IPO\ PERIOD\ DUM_i \\
&+ \sum_{k=22}^{36} \beta_k\ COUNTRY\ DUM_i
\end{aligned}
$$

4.4.2 Dividend policies

When studying the effect of private equity ownership on a company's dividend payout policy, I use four distinct dividend ratios variables widely used in prior literature (see e.g. Barclay et al., 2009; Bodnaruk and Österberg, 2013). If the *Excessive Dividend Hypothesis* holds, I observe PE-backed companies to pay out overly large dividends to their private equity owners after a bond issuance or loan withdrawal. Thus, the observed dividend ratios for PE-sponsored firms would be significantly above those of the non-PE-backed companies. However, as Kalay (1982) reports, covenant restricting dividend payout are common in bond and loan contract and with this type of covenants in place, evidence for the E*xcessive Dividend Hypothesis* might be left unnoticed.

To analyze whether private equity owners receive out-of-the-ordinary dividends from their portfolio companies around bond issues and loan withdrawals, I estimate Model 6 using the four alternative dependent variables (*DIV_PAYER_DUM*$_{t,t+2}$, *DIV_PAYOUT*$_{t,t+2}$, *DIV_YIELD*$_{t,t+2}$ and *DIV/ASSETS*$_{t,t+2}$) and the set of detailed independent variables. For consistency, the same model and a set of independent variables specified for the loan market is used when conducting the dividend policy analysis with the corporate loan data.

(6)

$$
\begin{aligned}
DIV/ASSETS_{t,t+2} &= \beta_0 + \beta_1 PE\ DUM_t + \beta_2 TANGIBILITY_{t-1} + \beta_3 M\ CAP_{t-1} + \beta_4 AGE_t \\
&+ \beta_5 SHARE\ REP\ DUM_{t-1} + \beta_6 ROA_{t-1} + \beta_7 LOSS\ DUM_{t-1} + \beta_8 LEVERAGE_{t-1} \\
&+ \beta_9 MARKET\ TO\ BOOK_{t-1} + \beta_{10} UTILITY\ DUM_t + \beta_{11} FINANCIAL\ DUM_t \\
&+ \beta_{12} SUBSIDIARY\ DUM_t + \beta_{13} RETURN_t + \beta_{14} DIV/ASSETS_{t-1} \\
&+ \sum_{k=15}^{17} \beta_k\ BOND\ (LOAN)\ PERIOD\ DUM_i + \sum_{k=18}^{21} \beta_k\ IPO\ PERIOD\ DUM_i \\
&+ \sum_{k=22}^{36} \beta_k\ COUNTRY\ DUM_i
\end{aligned}
$$

4.4.3 Share repurchases

When studying the effect of share repurchases as an alternative form of excessive shareholder compensation alongside dividends, I take the dependent variables from the dividend policy analysis, as introduced used by e.g. Barclay et al. (2009) and Bodnaruk and Österberg (2013). Given the theoretical indifference between dividends and share repurchases in a frictionless market, I modify the dependent variables from the dividend policy analysis to account for share repurchases rather than dividends. If the *Buyback Exit Hypothesis* holds, I notice private equity owned firms to perform more share repurchases after a bond issuance and loan issuance and the share repurchase ratios would be significantly higher for PE-backed issuers when comparing with the non-PE-owned firms.

To study whether private equity owners use share repurchases as a method of excessive remuneration from their portfolio companies around bond issues or loan withdrawals, I estimate Model 7 using the three alternative dependent variables (*SHARE_REPUR_DUM*$_{t,t+2}$, *SHARE_REPUR*$_{t,t+2}$ and *SHARE_REPUR/ASSETS*$_{t,t+2}$) and the following set of independent variables;

(7)

$$
\begin{aligned}
&SHARE\ REPUR/ASSETS_{t,t+2} \\
&\quad = \beta_0 + \beta_1 PE\ DUM_t + \beta_2 TANGIBILITY_{t-1} + \beta_3 M\ CAP_{t-1} + \beta_4 AGE_t \\
&\quad + \beta_5 DIV\ PAYER\ DUM_{t-1} + \beta_6 ROA_{t-1} + \beta_7 LOSS\ DUM_{t-1} + \beta_8 LEVERAGE_{t-1} \\
&\quad + \beta_9 MARKET\ TO\ BOOK_{t-1} + \beta_{10} UTILITY\ DUM_t + \beta_{11} FINANCIAL\ DUM_t \\
&\quad + \beta_{12} SUBSIDIARY\ DUM_t + \beta_{13} RETURN_t + \beta_{14} SHARE\ REPUR/ASSETS_{t-1} \\
&\quad + \sum_{k=15}^{17} \beta_k\ BOND\ (LOAN)\ PERIOD\ DUM_i + \sum_{k=18}^{21} \beta_k\ IPO\ PERIOD\ DUM_i \\
&\quad + \sum_{k=22}^{36} \beta_k\ COUNTRY\ DUM_i
\end{aligned}
$$

5. Analysis and empirical results

This section presents the empirical findings of the thesis by first analyzing the effect of private equity ownership on credit metrics of portfolio companies. The credit rating and spread analyses as well as the investment and payout policy analyses are conducted and reported for both the debt capital markets sample and the corporate loan sample, using both the focused [IPO+0, IPO+6] sample and the full [IPO+0, IPO+12] sample.

5.1 Credit rating evidence

Table 3 presents the results for credit rating analysis using the debt capital markets sample. In the case of S&P ratings, when studying the statistical significance of the private equity dummy variable coefficient (PE_DUM_t), I can note that private equity ownership does not seem to have an effect on the portfolio companies' rating in the [IPO+0, IPO+6] sample. However, I do find evidence from the larger [IPO+0, IPO+12] sample suggesting that private equity-backed companies would be rated approximately two notches lower than the non-PE-backed companies by S&P. With the observable increase in sample size, this finding is statistically significant at the 10% level. More revealing findings can be observed from Moody's ratings, as the coefficient of PE_DUM_t suggests approximately two and three notches lower ratings for PE-sponsored companies in the [IPO+0, IPO+6] and [IPO+0, IPO+12] samples, respectively, both at the 1% significance level. This finding is novel to Europe, as Huang et al. (2016) only record an approximately one notch higher S&P rating for bonds issued by PE-backed companies and fail to detect any significant difference resulting from private equity ownership in Moody's ratings.

Further, coefficients of the control variables are largely as expected, i.e. subordinated bonds ($SUBORD\_DUM_t$) and bonds issued by loss making companies ($LOSS\_DUM_{t-1}$) or companies with a preexisting large net debt position (NET_DEBT_t) receive lower ratings. On the other hand, stable financial sector issuers ($FINANCIAL\_DUM_t$) and issuers with significant tangible assets ($TANGIBILITY_{t-1}$) are viewed as a credit positive factor by the rating agencies. The coefficients of the control variables are also in the same range and of the same sign as in the US-based study of Huang et al. (2016), suggesting that the determinants of a company's credit rating do not vary across continents to a large extent.

Table 3. Bond credit ratings – Ordered logit regression analysis results

This table presents the ordered logit regression results of the bond credit rating analysis for both the narrower [IPO+0, IPO+6] sample (1-2) as well as for the full [IPO+0, IPO+12] sample (3-4), that cover all bonds issued between immediately after and a maximum of 6 or 12 years since a given firm's initial public offering date. The analysis is run with both S&P and Moody's ratings with the dependent variables *S&P_RATING$_t$* and *MOODY'S_RATING$_t$*, where 19 corresponds to a S&P rating AAA and a Moody's rating Aaa and 1 corresponds to a S&P rating CCC- and a Moody's rating Caa3. Coefficients and z-statistics are reported for independent variables. *PE_DUM$_t$* is the private equity dummy variable taking the value 1 if the bond issuer was backed by a private equity or venture capital sponsor on its initial public offering and taking the value 0 otherwise. Definitions for the remaining independent variables are provided in Table 1. For brevity, coefficients and z-statistics for the bond period dummy variables (*BOND_PERIOD_DUM$_i$*), IPO period dummy variables (*IPO_PERIOD_DUM$_i$*) and country-specific dummy variables (*COUNTRY_DUM$_i$*) are not reported in the table. Analysis is run with robust standard errors correcting for heteroscedasticity and the sample is clustered at the bond issuer level. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level in a two-tailed test.

Sample	[IPO+0, IPO+6]				[IPO+0, IPO+12]			
Dependent Variable	*S&P_RATING$_t$*		*MOODY'S_RATING$_t$*		*S&P_RATING$_t$*		*MOODY'S_RATING$_t$*	
Model #	*1*		*2*		*3*		*4*	
Independent Variables	coeff.	P > |z|	coeff.	P > |z|	coeff.	P > |z|	coeff.	P > |z|
PE_DUM$_t$	-1.638	0.256	-2.208 ***	0.005	-1.949 *	0.054	-3.150 ***	0.000
PROCEEDS$_t$	0.125	0.344	0.224	0.197	0.135	0.115	0.073	0.370
MATURITY$_t$	0.026	0.165	0.014	0.444	0.035 ***	0.003	0.035	0.110
SUBORD_DUM$_t$	-1.201 **	0.038	-1.418 ***	0.001	-1.881 ***	0.000	-2.028 ***	0.000
FIRST_BOND_DUM$_t$	-0.424	0.350	-0.418	0.390	0.963 **	0.013	-0.370	0.337
TOTAL_BONDS$_t$	0.012	0.276	0.010	0.286	0.019 ***	0.002	0.007	0.178
M_CAP$_{t-1}$	0.020 ***	0.007	0.029 ***	0.002	0.019 ***	0.001	0.020 ***	0.000
AGE$_t$	0.039 **	0.021	0.049 ***	0.002	0.025 **	0.049	0.028 ***	0.004
DIV_PAYER_DUM$_{t-1}$	1.346 **	0.029	0.649	0.389	1.134 **	0.041	0.701	0.167
SHARE_REPUR_DUM$_{t-1}$	-1.292	0.345	-1.523	0.165	-0.824	0.125	-0.584	0.221
ROA$_{t-1}$	6.529	0.139	-0.174	0.979	3.247	0.504	2.844	0.422
LOSS_DUM$_{t-1}$	-2.467 ***	0.002	-2.099 **	0.011	-2.482 ***	0.000	-2.246 ***	0.000
ICR$_{0,t-1}$	0.388 **	0.024	0.897 *	0.072	0.046	0.579	-0.063	0.513
ICR$_{5,t-1}$	-0.303	0.112	-0.080	0.702	0.005	0.960	-0.003	0.976
ICR$_{10,t-1}$	-0.180 *	0.089	0.039	0.649	-0.098	0.152	0.023	0.767
ICR$_{20,t-1}$	0.099	0.127	0.136 *	0.082	0.043 *	0.059	0.058	0.132
LEVERAGE$_{t-1}$	2.206	0.160	5.031 **	0.038	0.374	0.791	0.801	0.585
MARKET_TO_BOOK$_{t-1}$	-0.341	0.628	-0.874	0.187	0.158	0.652	0.576	0.113
TANGIBILITY$_{t-1}$	3.961 ***	0.003	3.963 ***	0.000	3.558 ***	0.001	4.532 ***	0.000
UTILITY_DUM$_t$	1.024	0.170	3.010 ***	0.000	0.604	0.215	2.032 ***	0.000
FINANCIAL_DUM$_t$	3.302 ***	0.004	6.141 ***	0.001	3.196 ***	0.000	5.131 ***	0.000
SOVEREIGN_RATING$_t$	0.382 **	0.017	0.031	0.826	0.082	0.696	0.093	0.505
NET_DEBT$_t$	-1.341	0.234	-1.952 **	0.031	-1.473 ***	0.003	-2.198 ***	0.007
SUBSIDIARY_DUM$_t$	1.504	0.307	3.242 *	0.062	1.536	0.298	1.900	0.396
RETURN$_t$	1.811 ***	0.004	2.451 ***	0.000	1.015 ***	0.003	0.387	0.310
n	375		366		993		994	
Pseudo R^2	0.299		0.339		0.277		0.283	

Table 4, on the other hand, presents the credit rating analysis using the corporate loan sample, from which I can note that the result on bond ratings no longer holds in the corporate loan setting. When first looking at the credit ratings issued by S&P, I can note from the analysis that in the [IPO+0, IPO+6] sampling period, with the coefficient of PE_DUM_t at -6.828, PE-backed companies would be rated 7 notches below their non-PE-backed peers. This observation, which is significant at the 10% level, seems fairly extreme, when compared to the statistically insignificant coefficient of PE_DUM_t of 0.134 in the full [IPO+0, IPO+12] sampling period. This observation is further backed by the findings of the same analysis conducted with Moody's ratings as I can observe a similar pattern of the coefficient of PE_DUM_t in the Moody's rating analysis.

When studying the coefficient of PE_DUM_t for Moody's ratings, I note that the coefficient of the private equity dummy variable is insignificant in both sampling periods [IPO+0, IPO+6] and [IPO+0, IPO+12], suggesting that private equity ownership does not seem to have a statistically meaningful relation with Moody's rating on the loan. Further, similar to the pattern in S&P rating analysis, the coefficient of PE_DUM_t is economically significant (-1.744) in the [IPO+0, IPO+6] period, but diminishes in economic significance when moving to the larger [IPO+0, IPO+12] sampling period. The fairly extreme coefficients of PE_DUM_t in the [IPO+0, IPO+6] period that do not survive when increasing the sample size in the [IPO+0, IPO+12] period could suggest that the smaller sample is dominated by a few poorly rated PE-backed companies. Thus, with the increase in sample size, there is neither statistical nor economic difference in the ratings for PE-backed and non-PE-backed firms for both S&P and Moody's.

I can thereby safely speculate that the findings could more be the result of a small sample size and a few outlying PE-backed debt issuers in the [IPO+0, IPO+6] sampling period rather than a genuine implication of private equity-backed companies' poor credit quality resulting from exploitative shareholder behavior. The signs of the coefficients for the control variables seem largely reasonable and comparable with those in the debt capital markets analysis. However, the lack of statistical significance of the control variables in the corporate loan analysis suggests in general that the loan issuer rating is less dependent on the issue and recent performance-related characteristics of a company when compared to the bond ratings.

Table 4. Loan credit ratings – Ordered logit regression analysis results

This table presents the ordered logit regression results of the loan credit rating analysis for both the narrower [IPO+0, IPO+6] sample (1-2) as well as for the full [IPO+0, IPO+12] sample (3-4), that cover all loans announced between immediately after and a maximum of 6 or 12 years since a given firm's initial public offering date. The analysis is run with both S&P and Moody's ratings with the dependent variables *S&P_RATING$_t$* and *MOODY'S_RATING$_t$*, where 19 corresponds to a S&P rating AAA and a Moody's rating Aaa and 1 corresponds to a S&P rating CCC- and a Moody's rating Caa3. Coefficients and z-statistics are reported for independent variables. *PE_DUM$_t$* is the private equity dummy variable taking the value 1 if the borrower was backed by a private equity or venture capital sponsor on its initial public offering and taking the value 0 otherwise. Definitions for the remaining independent variables are provided in Table 1. For brevity, coefficients and z-statistics for the loan period dummy variables (*LOAN_PERIOD_DUM$_i$*), IPO period dummy variables (*IPO_PERIOD_DUM$_i$*) and country-specific dummy variables (*COUNTRY_DUM$_i$*) are not reported in the table. Analysis is run with robust standard errors correcting for heteroscedasticity and the sample is clustered at the borrower level. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level in a two-tailed test.

Sample	[IPO+0, IPO+6]				[IPO+0, IPO+12]			
Dependent Variable	*S&P_RATING$_t$*		*MOODY'S_RATING$_t$*		*S&P_RATING$_t$*		*MOODY'S_RATING$_t$*	
Model #	*1*		*2*		*3*		*4*	
Independent Variables	coeff.	P > |z|	coeff.	P > |z|	coeff.	P > |z|	coeff.	P > |z|
PE_DUM$_t$	-6.828 *	0.054	-1.744	0.614	0.134	0.854	-0.220	0.728
PROCEEDS$_t$	0.252 ***	0.001	0.309 ***	0.000	0.130 **	0.043	0.171 **	0.011
MATURITY$_t$	-0.051 *	0.057	0.080	0.510	-0.073	0.284	-0.105	0.144
EXTENDABLE_DUM$_t$	0.667	0.326	0.980	0.349	0.292	0.278	0.492	0.146
REVOLVER_DUM$_t$	0.383	0.179	0.086	0.803	0.377	0.143	0.400 *	0.071
SUBORD_DUM$_t$	0.388	0.832	-4.679	0.290	-2.164 *	0.067	-3.628 ***	0.008
FIRST_LOAN_DUM$_t$	0.291	0.568	0.392	0.578	-0.093	0.764	-0.022	0.948
TOTAL_LOANS$_t$	0.162	0.106	-0.014	0.899	0.008	0.743	-0.014	0.587
M_CAP$_{t-1}$	0.016	0.133	0.053 ***	0.000	0.023 ***	0.000	0.035 ***	0.000
AGE$_t$	-0.010	0.467	-0.018	0.411	-0.007	0.423	0.011	0.154
DIV_PAYER_DUM$_{t-1}$	2.942	0.147	-1.381	0.434	1.932 **	0.048	0.526	0.677
SHARE_REPUR_DUM$_{t-1}$	-1.430 *	0.100	-0.624	0.451	0.267	0.584	-0.272	0.499
ROA$_{t-1}$	5.069	0.430	-2.397	0.632	1.676	0.731	0.236	0.930
LOSS_DUM$_{t-1}$	-1.201	0.452	-1.612	0.362	-0.805	0.219	0.188	0.808
ICR$_{0,t-1}$	0.453 *	0.089	0.050	0.841	0.154	0.201	0.057	0.641
ICR$_{5,t-1}$	-0.401	0.208	-0.053	0.911	-0.183	0.225	0.059	0.728
ICR$_{10,t-1}$	-0.086	0.713	-0.087	0.820	-0.024	0.850	-0.166	0.294
ICR$_{20,t-1}$	-0.008	0.810	0.068	0.165	0.052 ***	0.006	0.057 ***	0.003
LEVERAGE$_{t-1}$	4.255	0.160	-0.360	0.935	-1.899	0.268	-0.442	0.805
MARKET_TO_BOOK$_{t-1}$	0.694	0.192	-0.189	0.969	0.010	0.983	0.263	0.492
TANGIBILITY$_{t-1}$	1.566	0.435	0.347	0.859	0.174	0.880	2.114 **	0.027
UTILITY_DUM$_t$	0.916	0.594	1.728	0.316	1.981 **	0.011	2.286 ***	0.001
FINANCIAL_DUM$_t$	3.128 **	0.023	1.977	0.371	2.309	0.125	2.052 **	0.014
SOVEREIGN_RATING$_t$	-0.433	0.418	0.625	0.563	0.217 *	0.076	0.347 *	0.070
NET_DEBT$_t$	0.559	0.772	0.734	0.721	0.183	0.839	-0.051	0.950
SUBSIDIARY_DUM$_t$	1.909 **	0.022	1.548 *	0.056	-0.254	0.745	1.114	0.119
RETURN$_t$	1.933 **	0.047	2.163	0.113	0.379	0.449	0.780	0.228
n	180		156		416		373	
Pseudo R^2	0.388		0.401		0.227		0.254	

5.2 Bond yield and loan spread evidence

Table 5 portrays the results of the bond yield spread analysis using the debt capital markets sample and the analysis is first run without controlling for the credit rating of the bond (1 & 3), followed by a model specification (2 & 4) where the variation caused by the bonds' credit ratings has been controlled for.

By first looking at the statistical significance of the coefficient for the private equity dummy variable (PE_DUM_t) in the narrower [IPO+0, IPO+6] sample, I can note that coefficient at 33.378 remains insignificant before controlling for the credit rating of the bond. However, after controlling for S&P and Moody's ratings, the analysis yields a coefficient of 93.025 for PE_DUM_t, which is significant at the 10% level. This finding suggests that, without controlling for the credit ratings of the bonds, the yield spreads for bonds issued by PE-backed companies do not statistically differ from the yield spreads of non-PE-backed companies' bonds. However, when controlling for the credit risk portrayed by the rating agencies credit opinions, PE-backed companies receive bond financing with a 93 basis points higher yield spread compared to the non-PE-backed companies. As a result, I find that, although yield spreads do not significantly differ from one to another in the overall [IPO+0, IPO+6] period, private equity-sponsored companies receive bond financing with slightly more expensive terms than their non-PE-backed peers in the same credit rating notch.

When conducting the same analysis with the full [IPO+0, IPO+12] sample, without controlling for the credit rating of the bond, I observe a coefficient of 94.422 for the private equity dummy variable (PE_DUM_t), which is statistically significant at the 1% level. The result survives also after controlling for the information contained by the bonds' credit ratings, with the coefficient of PE_DUM_t standing at 91.775 – a result, which is statistically significant at the 5% level. Thus, in the full [IPO+0, IPO+12] sample, the yield spread for private equity-sponsored firms are on average higher than those of the non-PE-backed companies regardless of controlling for S&P and Moody's credit ratings or not. This observation clearly concludes that even in the full sampling period, private equity-backed companies receive bond financing with a 92 basis points higher yield spread when comparing to the non-PE-backed firms of the same credit rating notch.

When comparing the observations on the yield spreads of European PE-backed bond issuers to the US-based results of Huang et al. (2016), I find that again the implications differ quite

significantly from one continent to another. While I find PE-backed companies to receive bond financing with higher yield spreads compared to the non-PE-backed firms, US-based private equity-sponsored issuers receive financing with on average 70 basis points lower yield spreads than the non-PE-sponsored companies do (Huang et al., 2016). Thus, my results for the bond yield spread analysis remain novel to Europe and the seem to be fundamentally in line with the results of the bond credit rating analysis, as the lower credit rating for PE-backed issuers observed in Section 5.1 should theoretically result in a higher cost of debt financing through an increased risk of default.

The signs of the control variables, on the other hand, seem to be greatly in line with the results of Huang et al. (2016) and make theoretical sense. Making a loss in the financial year prior to the bond issuance ($LOSS\_DUM_{t-1}$) and issuing subordinated bonds ($SUBORD\_DUM_t$) imply an increase in the bond yield spread through a positive sign of the coefficient. Similarly, companies that were able to pay dividends in the financial year before the bond issuance ($DIV\_PAYER\_DUM_{t-1}$) observe a decrease in the cost of their bond financing through a negative sign of the coefficient. Further, the negative coefficients of the credit rating variables $S\&P\_RATING_t$ and $MOODY'S\_RATING_t$ are also in the expected range, suggesting that an increase in a firms rating implicitly decreases its cost of bond financing and that credit ratings do hold non-public information that is relevant in determining bond yield spreads.

Table 6, on the other hand, presents the loan spread analysis utilizing the corporate loan sample. Again, the results are reported first without controlling for the credit rating of the loan (1 & 3) and then using a modified model (2 & 4) accounting for the variation caused by the credit ratings.

Overall, the analysis yields similar results to the observations made in the bond market analysis, as I can observe a positive statistically significant coefficient for the private equity dummy variable PE_DUM_t in both of the sampling periods. In the focused [IPO+0, IPO+6] sampling period, the coefficient of PE_DUM_t stands at 145.774 without controlling for the loan's credit rating and decreases to 70.761 after controlling for S&P and Moody's ratings, with the coefficients being statistically significant at the 1% and 10% level, respectively. This finding suggests that lenders demand higher spreads on loans withdrawn by private equity-backed companies when comparing with the rest of the firms in the overall sample and on average 71

basis points higher spreads when comparing with non-PE-backed companies in the same rating class.

When conducting the same analysis with the larger [IPO+0, IPO+12] sample, I can observe a coefficient of 64.427 for PE_DUM_t without controlling for the credit rating and a slightly higher coefficient of 93.481 after controlling for the informational content of the rating agencies' opinion. The reported coefficients are statistically significant at the 10% and 1% level, respectively. I can note from the coefficients that, compared to the non-PE-sponsored companies, private equity-backed companies continue to borrow with more expensive terms even in the [IPO+0, IPO+12] sampling period and loan spreads for European sponsor-backed companies are on average 93 basis points above the spreads of the non-PE-backed firms in the same rating notch.

The novel results from the loan spread analysis are in line with the bond spread analysis as both suggest that European private equity-backed companies pay more on their debt financing when compared to the non-sponsor-backed companies. Interestingly, when studying the coefficients of the credit rating control variables, S&P ratings ($S\&P\_RATING_t$) do not seem to have a statistically significant effect on the loan spreads, whereas the negative statistically significant coefficient $MOODY'S\_RATING_t$ portrays the implicit effect of a higher credit rating on a company's borrowing costs. Similar to the results of the loan credit rating analysis discussed in Section 5.1, the rather fluctuating nature of the coefficient for PE_DUM_t can be seen as a result of the fairly small number of private equity-backed companies in the sample. However, with the coefficient staying positive and statistically significant in all of the four model specifications, it is relatively safe to speulate that lenders do view European private equity-owned companies somewhat differently from the remaining sample of firms.

Table 5. Bond yield spreads – OLS regression analysis results

This table presents the OLS regression results of the bond yield spread analysis for both the narrower [IPO+0, IPO+6] sample (1-2) as well as for the full [IPO+0, IPO+12] sample (3-4), that cover all bonds issued between immediately after and a maximum of 6 or 12 years since a given firm's initial public offering date. The analysis is run with the dependent variable $YIELD\_SPREAD_t$, which is the basis point difference of the bonds yield to maturity and the yield on a similar maturity sovereign bond of the country where the issuing firm is listed. $MATURITY_t$ is the bond maturity in years and similar maturity is defined as follows: 1-yr treasury if $MATURITY_t \leq 1.5$ yrs., 2-yr treasury if 1.5 yrs. < $MATURITY_t \leq 2.5$ yrs., 3-ys treasury if 2.5 yrs. < $MATURITY_t \leq 4.0$ yrs., 5-yr treasury if 4.0 yrs. < $MATURITY_t \leq 6.0$ yrs., 7-yr treasury if 6.0 yrs. < $MATURITY_t \leq 8.5$ yrs., 10-yr treasury if 8.5 yrs. < $MATURITY_t \leq 20.0$ yrs. and 30-yr treasury if 20 yrs. < $MATURITY_t$. Coefficients and t-statistics are reported for independent variables. PE_DUM_t is the private equity dummy variable taking the value 1 if the bond issuer was backed by a private equity or venture capital sponsor on its initial public offering and taking the value 0 otherwise. Definitions for the remaining independent variables are provided in Table 1. For brevity, coefficients and t-statistics for the bond period dummy variables ($BOND\_PERIOD\_DUM_i$), IPO period dummy variables ($IPO\_PERIOD\_DUM_i$) and country-specific dummy variables ($COUNTRY\_DUM_i$) are not reported in the table. Analysis is run with robust standard errors correcting for heteroscedasticity and the sample is clustered at the bond issuer level. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level in a two-tailed test.

Sample	[IPO+0, IPO+6]				[IPO+0, IPO+12]			
Dependent Variable	$YIELD\_SPREAD_t$		$YIELD\_SPREAD_t$		$YIELD\_SPREAD_t$		$YIELD\_SPREAD_t$	
Model #	*1*		*2*		*3*		*4*	
Independent Variables	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|
PE_DUM_t	33.578	0.553	93.025 *	0.063	94.422 ***	0.008	91.775 **	0.017
$DEFAULT\_SPREAD_t$	31.492	0.260	65.674 **	0.025	45.432 ***	0.008	63.387 ***	0.002
$PROCEEDS_t$	4.238	0.564	21.965 **	0.015	8.758 **	0.050	16.198 ***	0.002
$MATURITY_t$	2.341	0.202	5.431 ***	0.000	0.814	0.579	2.296 *	0.095
$SUBORD\_DUM_t$	203.216 ***	0.001	72.138	0.238	149.178 ***	0.000	74.912 ***	0.003
$FIRST\_BOND\_DUM_t$	64.369 *	0.051	33.854	0.441	76.324 ***	0.000	24.219	0.330
$TOTAL\_BONDS_t$	-0.776 *	0.058	0.606	0.315	-0.423	0.136	0.347 *	0.079
M_CAP_{t-1}	-0.113	0.807	0.388	0.464	-0.535 *	0.085	-0.004	0.991
AGE_t	-1.765 ***	0.001	-0.083	0.893	-1.763 ***	0.000	-0.362	0.494
$DIV\_PAYER\_DUM_{t-1}$	-120.280 ***	0.003	15.565	0.684	-122.177 ***	0.000	-66.405 **	0.021
$SHARE\_REPUR\_DUM_{t-1}$	-25.474	0.567	-17.639	0.660	-38.902	0.106	-28.170	0.232
ROA_{t-1}	114.040	0.696	1386.298 ***	0.003	377.691 **	0.021	171.516	0.231
$LOSS\_DUM_{t-1}$	148.850 ***	0.008	12.035	0.707	171.331 ***	0.000	37.770	0.275
$ICR_{0,t-1}$	-19.430 **	0.026	-8.201	0.349	-3.714	0.461	-6.581	0.124
$ICR_{5,t-1}$	15.259	0.159	7.761	0.487	5.345	0.336	6.982	0.135
$ICR_{10,t-1}$	4.338	0.529	-4.575	0.653	-1.666	0.620	-0.148	0.969
$ICR_{20,t-1}$	-1.942	0.465	2.387	0.469	0.009	0.993	0.963	0.393
$LEVERAGE_{t-1}$	57.063	0.521	124.598	0.165	14.984	0.811	-46.488	0.478
$MARKET\_TO\_BOOK_{t-1}$	-27.630	0.356	-26.826	0.537	-44.743 **	0.037	-23.349	0.376
$TANGIBILITY_{t-1}$	-90.429	0.209	170.289	0.108	-12.928	0.766	63.209	0.333
$UTILITY\_DUM_t$	-109.897 **	0.046	67.540	0.240	-70.200 ***	0.006	-9.017	0.680
$FINANCIAL\_DUM_t$	-159.170 ***	0.002	189.917 **	0.021	-106.131 ***	0.001	2.781	0.947
$SOVEREIGN\_RATING_t$	13.787	0.141	8.164	0.427	23.988 ***	0.002	30.685 ***	0.000
NET_DEBT_t	105.123	0.172	77.364	0.233	138.037 ***	0.000	50.772 *	0.100
$SUBSIDIARY\_DUM_t$	-60.999	0.358	-21.841	0.786	-115.751 **	0.016	-91.176 *	0.089
$RETURN_t$	-109.116 **	0.011	14.678	0.684	66.990 **	0.022	-66.941 ***	0.006
$S\&P\_RATING_t$			-26.665 *	0.061			-22.475 **	0.024
$MOODY'S\_RATING_t$			-18.673 ***	0.010			-21.449 ***	0.004
n	349		242		944		687	
R^2	0.616		0.748		0.543		0.624	

Table 6. Loan spreads – OLS regression results

This table presents the OLS regression results of the loan spread analysis for both the narrower [IPO+0, IPO+6] sample (1-2) as well as for the full [IPO+0, IPO+12] sample (3-4), that cover all loans announced between immediately after and a maximum of 6 or 12 years since a given firm's initial public offering date. The analysis is run with the dependent variable $LOAN\_SPREAD_t$, which is the basis point difference of a loan's maximum spread and its reference rate (EURIBOR or LIBOR) on the loan announcement date. Coefficients and t-statistics are reported for independent variables. PE_DUM_t is the private equity dummy variable taking the value 1 if the borrower was backed by a private equity or venture capital sponsor on its initial public offering and taking the value 0 otherwise. Definitions for the remaining independent variables are provided in Table 1. For brevity, coefficients and t-statistics for the loan period dummy variables ($LOAN\_PERIOD\_DUM_i$), IPO period dummy variables ($IPO\_PERIOD\_DUM_i$) and country-specific dummy variables ($COUNTRY\_DUM_i$) are not reported in the table. Analysis is run with robust standard errors correcting for heteroscedasticity and the sample is clustered at the borrower level. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level in a two-tailed test.

Sample	[IPO+0, IPO+6]				[IPO+0, IPO+12]			
Dependent Variable	$LOAN\_SPREAD_t$		$LOAN\_SPREAD_t$		$LOAN\_SPREAD_t$		$LOAN\_SPREAD_t$	
Model #	*1*		*2*		*3*		*4*	
Independent Variables	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|
PE_DUM_t	145.774 ***	0.000	70.761 *	0.089	64.427 *	0.071	93.481 ***	0.002
$PROCEEDS_t$	-3.283 *	0.072	-1.290	0.607	-2.149	0.471	1.275	0.643
$MATURITY_t$	0.365	0.851	0.159	0.952	4.595	0.533	5.911	0.478
$EXTENDABLE\_DUM_t$	-30.601	0.133	-16.141	0.236	-37.028 ***	0.005	-9.681	0.587
$REVOLVER\_DUM_t$	-3.911	0.620	-2.144	0.829	-31.986 *	0.052	-30.702	0.116
$SUBORD\_DUM_t$	200.903 ***	0.000	214.911 ***	0.000	228.614 ***	0.001	223.542 ***	0.000
$FIRST\_LOAN\_DUM_t$	12.309	0.253	12.842	0.240	11.935	0.396	3.065	0.843
$TOTAL\_LOANS_t$	0.298	0.935	5.413	0.135	1.790	0.281	5.154 **	0.038
M_CAP_{t-1}	0.055	0.800	0.318 *	0.088	-0.031	0.867	0.717 ***	0.006
AGE_t	0.595	0.128	1.470 ***	0.000	-0.166	0.685	0.649 *	0.052
$DIV\_PAYER\_DUM_{t-1}$	-45.192	0.405	-22.294	0.384	-70.086 **	0.013	9.727	0.835
$SHARE\_REPUR\_DUM_{t-1}$	-7.621	0.739	-11.220	0.665	-1.343	0.956	22.607	0.450
ROA_{t-1}	-61.373	0.623	-89.238	0.394	33.493	0.827	25.127	0.844
$LOSS\_DUM_{t-1}$	-29.510	0.264	-6.392	0.857	8.091	0.775	27.962	0.408
$ICR_{0,t-1}$	-1.561	0.843	-0.547	0.906	1.019	0.825	8.822	0.341
$ICR_{5,t-1}$	-1.464	0.836	6.921	0.384	-0.807	0.905	-4.710	0.476
$ICR_{10,t-1}$	3.066	0.751	-125.261	0.142	0.049	0.993	-5.416	0.387
$ICR_{20,t-1}$	-0.322	0.783	17.829	0.108	-0.391	0.527	2.074 **	0.031
$LEVERAGE_{t-1}$	-121.422 *	0.051	-58.540	0.447	8.272	0.897	-15.932	0.815
$MARKET\_TO\_BOOK_{t-1}$	10.870	0.330	15.959 *	0.065	-5.295	0.625	4.156	0.611
$TANGIBILITY_{t-1}$	-74.688 **	0.022	-46.969	0.376	-23.850	0.565	17.265	0.693
$UTILITY\_DUM_t$	-40.120	0.168	-12.587	0.637	-22.923	0.408	20.534	0.526
$FINANCIAL\_DUM_t$	-80.553 **	0.016	84.646 *	0.066	-45.851 *	0.075	43.407	0.269
$SOVEREIGN\_RATING_t$	0.059	0.995	5.224	0.327	-5.916	0.228	-2.630	0.537
NET_DEBT_t	-46.696	0.229	-4.759	0.864	101.675	0.160	124.732	0.117
$SUBSIDIARY\_DUM_t$	47.133	0.457	17.663	0.614	54.737	0.154	47.627	0.415
$RETURN_t$	11.566	0.508	36.030 **	0.036	13.613	0.301	33.238	0.110
$S\&P\_RATING_t$			8.228	0.183			-2.166	0.855
$MOODY'S\_RATING_t$			-26.655 ***	0.002			-20.759 *	0.080
n	141		106		321		229	
R^2	0.881		0.958		0.596		0.719	

5.3 Investment decision evidence

Table 7 presents the results of the analysis on investment decision changes following a bond issuance. When first looking at the focused [IPO+0, IPO+6] sample, I can observe statistically significant negative coefficients for all dependent variables used in the different specifications, suggesting that regardless of the specification, private equity-backed companies invest less relative to their size than the non-PE-owned companies do. When studying the coefficient of the private equity dummy variable (PE_DUM_t), I can note the following three observations. On average, over the next three years after a bond issuance PE-backed companies invest 25.3 percentage points (pp) less in capital expenditures relative to their tangible assets, 4.5 pp less in capital expenditure relative to their total assets as well as 4.5 pp less in all investments (both capital and R&D) relative to their total assets. The first result is statistically significant at the 10% level, with the two latter being both significant at the 1% level. The results imply that in the three years following a bond issuance, PE-backed companies do not resort to excessively risky investments as their capital expenditure levels are below the remaining companies in the sample.

When analyzing the full [IPO+0, IPO+12] sample, I can note the investment policy of PE-backed companies, observed in the focused [IPO+0, IPO+6] sample, does not hold anymore as more time passes since the PE portfolio company's IPO. Two model specifications (Models 4 & 6) show evidence that there is no statistically significant difference in the amount PE-backed and non-PE-backed companies invest relative to their size in the three years following a bond issuance, as the coefficient for the private equity dummy variable in models specified for $CAPEX/TANG_{t,t+2}$ and $(CAPEX+RD)/AT_{t,t+2}$ are both statistically insignificant. However, when studying the private equity-backed companies' capital expenditure relative to their total assets ($CAPEX/AT_{t,t+2}$), I still observe a coefficient of -2.738 for PE_DUM_t, which is significant at the 5% level. This result suggests that, while the clearly noticeable difference in investment policies between PE-backed and non-PE-backed companies has largely diminished, when moving to the larger [IPO+0, IPO+12] sampling period, I still find evidence suggesting that the private equity-sponsored firms would spend on average 2.7 pp less in capital expenditure relative to their total assets. Thus, even in the full sampling period extending up to 12 years since the company's initial public offering, I do not find evidence of excessive investment levels for PE-backed companies compared to the non-PE-backed firms.

When contrasting my results with those observed by Huang et al. (2016), I can note that my results are of the same sign and magnitude as those observed in the US-based study. The coefficient of PE_DUM_t, stood in different model specifications at -8.63 for $CAPEX/TANG_{t,t+2}$, at -3.69 for $CAPEX/AT_{t,t+2}$ and at -3.68 for $(CAPEX+RD)/AT_{t,t+2}$. However, the authors only find the spending on capital expenditure relative to a company's tangible assets to be statistically significant (at the 5% level), implying that PE-sponsored companies spend 8.6 pp less in capital expenditures relative to their tangible assets when compared to the general corporate sample. Coefficients for the control variables in my analysis are to some extent of the same sign as in the US-based study of Huang et al. (2016), for example those of $MARKET\_TO\_BOOK_{t-1}$ and $UTILITY\_DUM_t$. Thus, with no sign of exploitative investment policies, the observation of private equity portfolio companies spending less in capital expenditures after a bond offering holds almost equally in Europe and in the US.

Table 7. Investment decisions after a bond issuance – Tobit regression results

This table presents the Tobit regression results of the analysis of investment decisions following a bond issuance for both the narrower [IPO+0, IPO+6] sample (1-3) as well as for the full [IPO+0, IPO+12] sample (4-6), that cover all bonds issued between immediately after and a maximum of 6 or 12 years since a given firm's initial public offering date. The analysis is run with the three following dependent variables; $CAPEX/TANG_{t,t+2}$ is the three-year average (bond issue year *t* and two preceding financial years *t+1, t+2* for all) capital expenditure divided by the tangible assets at the beginning of the bond issue year, $CAPEX/AT_{t,t+2}$ is the three-year average capital expenditure divided by the total assets at the beginning of the bond issue year and $(CAPEX+RD)/AT_{t,t+2}$ is the three-year average of the sum of capital expenditure and R&D investments divided by the total assets at the beginning of the bond issue year. Coefficients and t-statistics are reported for independent variables. PE_DUM_t is the private equity dummy variable taking the value 1 if the bond issuer was backed by a private equity or venture capital sponsor on its initial public offering and taking the value 0 otherwise. Definitions for the remaining independent variables are provided in Table 1. For brevity, coefficients and t-statistics for the bond period dummy variables ($BOND\_PERIOD\_DUM_i$), IPO period dummy variables ($IPO\_PERIOD\_DUM_i$) and country-specific dummy variables ($COUNTRY\_DUM_i$) are not reported in the table. Tobit regressions are run with a lower limit of zero. The analysis is conducted with robust standard errors correcting for heteroscedasticity and the sample is clustered at the bond issuer level. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level in a two-tailed test.

Sample	[IPO+0, IPO+6]						[IPO+0, IPO+12]					
Dependent Variable	$CAPEX/TANG_{t,t+2}$		$CAPEX/AT_{t,t+2}$		$(CAPEX+RD)/AT_{t,t+2}$		$CAPEX/TANG_{t,t+2}$		$CAPEX/AT_{t,t+2}$		$(CAPEX+RD)/AT_{t,t+2}$	
Model #	*1*		*2*		*3*		*4*		*5*		*6*	
Independent Variables	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|
PE_DUM_t	-25.278 *	0.051	-4.488 ***	0.000	-4.473 ***	0.001	27.048	0.445	-2.738 **	0.015	-2.013	0.103
$TANGIBILITY_{t-1}$	26.149 **	0.041	2.189	0.119	2.251	0.132	77.079 **	0.011	4.382 ***	0.000	4.787 ***	0.000
M_CAP_{t-1}	0.192 **	0.019	-0.001	0.877	-0.001	0.890	0.186	0.264	0.002	0.730	-0.001	0.853
AGE_t	0.088	0.456	0.004	0.686	0.004	0.756	0.334	0.210	-0.001	0.927	0.003	0.850
$DIV\_PAYER\_DUM_{t-1}$	16.850 *	0.064	-1.546 *	0.063	-1.429 *	0.078	51.289	0.234	-0.582	0.461	-0.710	0.371
$SHARE\_REPUR\_DUM_{t-1}$	-4.571	0.607	-2.113 ***	0.008	-2.348 ***	0.009	34.309	0.369	-0.793	0.335	-0.617	0.501
ROA_{t-1}	138.560	0.153	-20.253 **	0.036	-17.841 *	0.072	-13.484	0.901	-0.308	0.965	0.097	0.103
$LOSS\_DUM_{t-1}$	8.213	0.468	-0.225	0.859	0.035	0.980	27.545	0.400	0.397	0.573	0.508	0.494
$LEVERAGE_{t-1}$	-9.343	0.710	-0.817	0.739	-2.038	0.399	45.382	0.460	0.569	0.790	-0.945	0.671
$MARKET\_TO\_BOOK_{t-1}$	-1.053	0.811	3.472 ***	0.000	3.408 ***	0.000	-3.072	0.640	2.579 ***	0.000	2.871 ***	0.000
$UTILITY\_DUM_t$	19.636	0.108	-1.132	0.220	-1.890 **	0.044	46.071 **	0.032	-1.215 **	0.035	-1.512 ***	0.009
$FINANCIAL\_DUM_t$	-5.048	0.651	-5.577 ***	0.000	-6.505 ***	0.000	37.298	0.332	-4.756 ***	0.000	-5.350 ***	0.000
$SUBSIDIARY\_DUM_t$	-7.169	0.804	0.186	0.908	-4.274	0.804	18.120	0.566	-0.911	0.550	-1.822	0.252
$CAPEX/TANG_{t-1}$	-0.006 ***	0.000					0.003	0.787				
$CAPEX/AT_{t-1}$			0.009	0.670					0.040 *	0.061		
$(CAPEX+RD)/AT_{t-1}$					0.012	0.461					0.037 **	0.023
n	467		467		467		1197		1197		1197	
Pseudo R^2	0.045		0.190		0.190		0.015		0.178		0.175	

Table 8 shows the observations on investment policy changes following a loan withdrawal. First analyzing the results of the analysis run with the focused [IPO+0, IPO+6] sample, I notice that none of the coefficients for the private equity dummy variable (PE_DUM_t) in the different model specifications ($CAPEX/TANG_{t,t+2}$, $CAPEX/AT_{t,t+2}$ and $(CAPEX+RD)/AT_{t,t+2}$) yield a statistically significant result. This result implies that in the three years following a loan withdrawal, PE-backed companies do not invest more relative to their size, when comparing with the similar non-PE-backed companies in the sample. However, when analyzing the economic significance of the results, the coefficient of 336.346 for PE_DUM_t in the $CAPEX/TANG_{t,t+2}$ model specification seems rather extreme and the two latter coefficients in Models 2 and 3 seem rather small compared to the results observed in Table 7, when conducting the same analysis with the debt capital markets sample. This might of course suggest that the bond issuers and loan borrowers differ in terms of their investment policies, but as before with my novel corporate loan sample, the relatively small amount of observations in the focused [IPO+0, IPO+6] sampling period can affect the reliability of the result.

When shifting the focus over to the full [IPO+0, IPO+12], I can observe that the coefficients for the private equity dummy variable are largely in line with those observed in the debt capital markets sample in Models 4-6 of Table 7. The analysis yields PE_DUM_t coefficients of 32.153 for $CAPEX/TANG_{t,t+2}$ specification followed by coefficients of -2.185 and -2.663 for $CAPEX/AT_{t,t+2}$ and $(CAPEX+RD)/AT_{t,t+2}$ specifications, respectively, with the latter two showing statistical significance at the 5% and 10% levels. The result implies that, similar to the debt capital markets sample, PE-backed companies tend to spend on average 2.2 pp less in capital expenditure relative to their total assets and 2.7 pp less in capital and R&D expenditure relative to their total assets. Interestingly, this result again holds even up to 12 years since the company's initial public offering and no overly risky investment policies resulting from the private equity ownership can be observed from the sample, when compared to the non-PE-sponsor peer group.

Further, the similarity of observed PE_DUM_t coefficients between investment decisions after a bond issuance and a loan withdrawal in the [IPO+0, IPO+12] sampling period provides some evidence for the small amount of observations in the narrower [IPO+0, IPO+6] sampling period, possibly affecting the analysis on loans withdrawn up to six years since the company's IPO.

Table 8. Investment decisions after a loan withdrawal – Tobit regression results

This table presents the Tobit regression results of the analysis of investment decisions following a loan withdrawal for both the narrower [IPO+0, IPO+6] sample (1-3) as well as for the full [IPO+0, IPO+12] sample (4-6), that cover all loans issued between immediately after and a maximum of 6 or 12 years since a given firm's initial public offering date. The analysis is run with the three following dependent variables; $CAPEX/TANG_{t,t+2}$ is the three-year average (loan withdrawal year *t* and two preceding financial years *t+1, t+2* for all) capital expenditure divided by the tangible assets at the beginning of the loan withdrawal year, $CAPEX/AT_{t,t+2}$ is the three-year average capital expenditure divided by the total assets at the beginning of the loan withdrawal year and $(CAPEX+RD)/AT_{t,t+2}$ is the three-year average of the sum of capital expenditure and R&D investments divided by the total assets at the beginning of the loan withdrawal year. Coefficients and t-statistics are reported for independent variables. PE_DUM_t is the private equity dummy variable taking the value 1 if the borrower was backed by a private equity or venture capital sponsor on its initial public offering and taking the value 0 otherwise. Definitions for the remaining independent variables are provided in Table 1. For brevity, coefficients and t-statistics for the loan period dummy variables ($LOAN\_PERIOD\_DUM_i$), IPO period dummy variables ($IPO\_PERIOD\_DUM_i$) and country-specific dummy variables ($COUNTRY\_DUM_i$) are not reported in the table. Tobit regressions are run with a lower limit of zero. The analysis is conducted with robust standard errors correcting for heteroscedasticity and the sample is clustered at the borrower level. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level in a two-tailed test.

Sample	[IPO+0, IPO+6]						[IPO+0, IPO+12]					
Dependent Variable	$CAPEX/TANG_{t,t+2}$		$CAPEX/AT_{t,t+2}$		$(CAPEX+RD)/AT_{t,t+2}$		$CAPEX/TANG_{t,t+2}$		$CAPEX/AT_{t,t+2}$		$(CAPEX+RD)/AT_{t,t+2}$	
Model #	*1*		*2*		*3*		*4*		*5*		*6*	
Independent Variables	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|
PE_DUM_t	336.345	0.268	-0.837	0.592	-0.877	0.603	32.153	0.830	-2.185 **	0.017	-2.663 ***	0.008
$TANGIBILITY_{t-1}$	-128.482	0.838	1.362	0.490	0.195	0.923	-30.430	0.821	0.678	0.638	0.024	0.987
M_CAP_{t-1}	2.037	0.365	-0.013	0.331	-0.013	0.341	-1.102	0.295	-0.002	0.806	-0.009	0.263
AGE_t	-1.064	0.793	0.009	0.655	0.008	0.717	1.172	0.555	-0.016 *	0.097	-0.002	0.866
$DIV\_PAYER\_DUM_{t-1}$	-843.772 **	0.018	1.495	0.480	1.807	0.439	108.993	0.572	1.327	0.291	1.460	0.262
$SHARE\_REPUR\_DUM_{t-1}$	393.739	0.560	0.050	0.974	-0.291	0.854	133.794	0.470	-0.666	0.392	-0.645	0.424
ROA_{t-1}	-593.500	0.535	-13.039	0.116	-11.501	0.185	-570.409	0.347	-11.001 **	0.036	-12.320 *	0.053
$LOSS\_DUM_{t-1}$	-111.919	0.516	-2.720 *	0.071	-3.084 *	0.057	-205.203	0.173	-1.829 *	0.059	-2.535 **	0.023
$LEVERAGE_{t-1}$	-878.246	0.277	-0.824	0.847	-3.361	0.466	-201.078	0.425	0.353	0.905	-1.834	0.559
$MARKET\_TO\_BOOK_{t-1}$	14.095	0.785	1.208 **	0.018	0.887 *	0.098	0.781	0.980	1.671 **	0.017	1.620 **	0.033
$UTILITY\_DUM_t$	20.557	0.920	0.360	0.758	-0.227	0.849	202.299	0.148	-1.492	0.490	-1.693 **	0.033
$FINANCIAL\_DUM_t$	127.302	0.645	-2.841	0.145	-3.200	0.110	-62.376	0.629	-3.225 ***	0.010	-3.805 ***	0.006
$SUBSIDIARY\_DUM_t$	93.242	0.295	0.124	0.812	0.059	0.923	81.928	0.396	-1.035	0.171	-1.379	0.128
$CAPEX/TANG_{t-1}$	-0.034 *	0.068					-0.036 *	0.054				
$CAPEX/AT_{t-1}$			0.472 ***	0.000					0.441 ***	0.000		
$(CAPEX+RD)/AT_{t-1}$					0.560 ***	0.000					0.496 ***	0.000
n	189		189		189		450		450		450	
R^2	0.284		0.214		0.216		0.006		0.156		0.158	

5.4 Dividend policy evidence

Table 9 illustrates the findings of the analysis on dividend policy changes following a bond issuance. When studying the narrower [IPO+0, IPO+6] sampling period (Panel A), I can first note the positive sign of the coefficients for PE_DUM_t in Models 1 and 2. This implies that, in the context of $DIV\_PAYER\_DUM_{t,t+2}$ specification, private equity-sponsored firms are more likely to pay out dividends in the three years following the bond issuance, when compared to the non-PE-backed companies of the sample. However, the PE_DUM_t coefficient is only statistically significant (at the 5% level) in Model 1, whereas, after controlling for the lagged dividend payer dummy variable, the coefficient becomes statistically insignificant. Huang et al. (2016) observe the similar, although opposite, pattern, as the US-based PE-backed bond issuers are less likely to pay out dividends than their non-PE-backed peers. However, the observed pattern can be interpreted to lessen the value of the observation from Model 1, with Model 2 implying that there is no difference in the way PE-backed and non-PE-backed issuers start or stop paying out dividends in the three years following the bond issuance (Huang et al., 2016).

To analyze the dividend payout policies of private equity-sponsored bond issuers further, I look into Models 3-5 of Panel A, which cover three different model specifications on the relative size of the dividend payout. I find that the coefficient of PE_DUM_t in two of the model specifications ($DIV\_PAYOUT_{t,t+2}$ and $DIV\_YIELD_{t,t+2}$), yield a both economically and statistically significant result. The coefficients -19.723 and -2.593, respectively, imply that, when compared to the dividend payouts of non-PE-sponsored firms, PE-backed bond issuers pay out 19.7 pp less in dividends relative to their income before extraordinary items (income before NRI) for the financial year and pay out a 2.6 pp lower dividend per share relative to the end-of-the-year share price of the company. Both findings are averages over the three years after the bond issuance and statistically significant at the 10% significance level.

Interestingly, the total dividend payout relative to the total assets of a firm ($DIV/ASSETS_{t,t+2}$) does not significantly differ for PE-backed firms from the rest of the bond issuers in the sample. Contrasting my European results with the US-based study of Huang et al. (2016), Models 3-5 yield very similar results. After controlling for the lagged dividend payout variables, Huang et al. (2016) find that private equity-backed companies pay out 10.4 pp less in dividends relative to their income before NRI for the financial year, as well as pay out 0.6 pp less in dividends relative to the total assets of the company. Both of their findings are significant at the 10% level.

Further, when studying the control variables used in the Models, their coefficients are largely of the same sing in my European analysis as they are in the US-based study of Huang et al. (2016).

Overall, my European analysis PE portfolio company dividend policy analysis yields the following implication in the [IPO+0, IPO+6] sampling period; private equity-backed companies are generally more likely to pay out dividends in the three years following a bond issuance. However, when controlling for the lagged dividend payer variable, PE-sponsored companies are no more likely to start or stop paying out dividends over the three-year period after the bond issuance than the rest of the companies in the sample are. Further, the results imply that actually, the total dividends paid out by private equity-owned companies are smaller relative to their income before NRI and the dividend per share is lower relative to their end-of-the-year share price when compared to the non-PE-backed firms in the sample. Thus, I can fairly comfortably suggest that private equity-owned companies do not resort to overly excessive dividend payouts after a large influx of capital through a bond issuance.

Table 9. Dividend policy changes after a bond issuance – Logit and Tobit regression analysis results

This table presents the Logit (1-2, 6-7) and Tobit (3-5, 8-10) regression results of the analysis of dividend policy changes following a bond issuance for both the narrower [IPO+0, IPO+6] sample (1-5) as well as for the full [IPO+0, IPO+12] sample (6-10), that cover all bonds issued between immediately after and a maximum of 6 or 12 years since a given firm's initial public offering date. The analysis is run with the four following dependent variables; $DIV\_PAYER\_DUM_{t,t+2}$ is a dummy variable taking the value 1 if the issuer has paid a dividend in at least one of the three years (bond issue year *t* and two preceding financial years *t+1, t+2* for all) and taking the value 0 otherwise, $DIV\_PAYOUT_{t,t+2}$ is the three-year average of common dividend divided by end-of-year income before extraordinary items, $DIV\_YIELD_{t,t+2}$ is the three-year average of dividend per share divided by the end-of-year share price in a given year and $DIV/ASSETS_{t,t+2}$ is the three-year average of common dividend divided by the total assets at the beginning of the bond issue year. Coefficients and z- and t-statistics are reported for independent variables. PE_DUM_t is the private equity dummy variable taking the value 1 if the bond issuer was backed by a private equity or venture capital sponsor on its initial public offering and taking the value 0 otherwise. Definitions for the remaining independent variables are provided in Table 1. For brevity, coefficients and z- and t-statistics for the bond period dummy variables ($BOND\_PERIOD\_DUM_i$), IPO period dummy variables ($IPO\_PERIOD\_DUM_i$) and country-specific dummy variables ($COUNTRY\_DUM_i$) are not reported in the table. Tobit regressions are run with a lower limit of zero. The analysis is conducted with robust standard errors correcting for heteroscedasticity and the sample is clustered at the bond issuer level. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level in a two-tailed test.

Panel A

Sample	[IPO+0, IPO+6]									
Dependent Variable	$DIV\_PAYER\_DUM_{t,t+2}$				$DIV\_PAYOUT_{t,t+2}$		$DIV\_YIELD_{t,t+2}$		$DIV/ASSETS_{t,t+2}$	
Model #	*1*		*2*		*3*		*4*		*5*	
Independent Variables	coeff.	P > |z|	coeff.	P > |z|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|
PE_DUM_t	2.727 **	0.021	4.811	0.131	-19.723 *	0.091	-2.593 *	0.063	0.346	0.135
$TANGIBILITY_{t-1}$	3.295	0.104	0.248	0.938	-45.793 ***	0.006	-2.993 *	0.061	-0.343	0.299
M_CAP_{t-1}	0.583 *	0.065	1.022 **	0.013	0.216 ***	0.003	0.002	0.734	-0.005 **	0.045
AGE_t	0.006	0.647	-0.204 **	0.024	0.191	0.248	-0.018	0.206	0.000	0.984
$SHARE\_REPUR\_DUM_{t-1}$	3.446 **	0.038	7.418 **	0.019	-12.989	0.284	-3.287	0.281	0.234	0.120
ROA_{t-1}	4.758	0.617	-6.359	0.548	136.893 *	0.076	-4.186	0.706	5.777 ***	0.000
$LOSS\_DUM_{t-1}$	-0.715	0.528	-2.977 ***	0.000	-20.794	0.361	-3.140	0.160	0.078	0.693
$LEVERAGE_{t-1}$	3.488 **	0.048	-1.140	0.745	18.014	0.437	-1.026	0.683	-0.579	0.166
$MARKET\_TO\_BOOK_{t-1}$	-1.272 ***	0.002	-2.592	0.154	-5.584	0.195	-1.289 **	0.031	0.243 *	0.080
$UTILITY\_DUM_t$									0.985 ***	0.010
$FINANCIAL\_DUM_t$									-0.360 **	0.030
$SUBSIDIARY\_DUM_t$	0.609 ***	0.002	-1.903	0.622	12.659	0.451	2.005	0.180	-0.046	0.894
$RETURN_t$	-0.229	0.742	2.248	0.117	-10.122	0.266	0.522	0.429	0.369 **	0.027
$DIV\_PAYER\_DUM_{t-1}$			11.133 ***	0.000						
DIV_PAYOUT_{t-1}					0.039	0.230				
DIV_YIELD_{t-1}							1.144 *	0.062		
$DIV/ASSETS_{t-1}$									0.394 ***	0.000
n	429		429		485		483		467	
Pseudo R^2	0.417		0.868		0.025		0.044		0.435	

Table 9. (Continuing)

Panel B

Sample	[IPO+0, IPO+12]									
Dependent Variable	$DIV\_PAYER\_DUM_{t,t+2}$				$DIV\_PAYOUT_{t,t+2}$		$DIV\_YIELD_{t,t+2}$		$DIV/ASSETS_{t,t+2}$	
Model #	*6*		*7*		*8*		*9*		*10*	
Independent Variables	coeff.	P > |z|	coeff.	P > |z|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|
PE_DUM_t	0.911	0.295	1.244	0.341	-8.695	0.568	-1.298	0.111	0.197	0.392
$TANGIBILITY_{t-1}$	1.311	0.356	-3.196	0.143	4.172	0.850	0.587	0.553	-0.293	0.318
M_CAP_{t-1}	0.012	0.276	0.028 ***	0.006	0.132	0.411	0.006	0.476	0.001	0.708
AGE_t	-0.010	0.425	-0.026 *	0.052	-0.038	0.871	-0.011	0.377	0.001	0.560
$SHARE\_REPUR\_DUM_{t-1}$	1.394	0.175	0.675	0.646	11.347	0.524	-0.720	0.309	0.178	0.347
ROA_{t-1}	7.774 *	0.061	-2.103	0.562	11.078	0.872	5.607	0.488	3.490 **	0.036
$LOSS\_DUM_{t-1}$	-0.384	0.676	-2.083 **	0.012	-33.573 *	0.066	-1.046	0.494	-0.112	0.516
$LEVERAGE_{t-1}$	3.196 *	0.061	0.250	0.924	67.099 **	0.013	2.373	0.277	-0.343	0.256
$MARKET\_TO\_BOOK_{t-1}$	-0.216	0.578	-0.938 *	0.076	-2.359	0.682	-1.085 ***	0.005	0.252 **	0.048
$UTILITY\_DUM_t$									0.374	0.115
$FINANCIAL\_DUM_t$									-0.744 ***	0.000
$SUBSIDIARY\_DUM_t$	-0.040	0.978	-0.224	0.885	-14.731	0.509	-0.241	0.892	0.094	0.749
$RETURN_t$	-0.584	0.227	0.917	0.176	-36.738 **	0.036	0.993	0.313	0.140	0.282
$DIV\_PAYER\_DUM_{t-1}$			9.881 ***	0.000						
DIV_PAYOUT_{t-1}					-0.004 *	0.100				
DIV_YIELD_{t-1}							0.212 **	0.031		
$DIV/ASSETS_{t-1}$									0.270 ***	0.006
n	1197		1197		1247		1245		1197	
Pseudo R^2	0.446		0.857		0.024		0.029		0.393	

Panel B of Table 9, on the other hand, reports the findings from the larger [IPO+0, IPO+12] sample. I can observe that the findings from Panel A do not hold in the full sampling period, as the coefficients for PE_DUM_t in Models 6-10 remain statistically insignificant. Interestingly, however, when analyzing the economic significance of the PE_DUM_t coefficients in all specifications, I can note that they are in of the same sign as in the focused [IPO+0, IPO+6] sample, but slightly smaller in magnitude. Both the statistical and economic significance of the coefficient for the private equity dummy variable in Models 6-10 provide evidence that in the full [IPO+0, IPO+12] sample, dividend payout policies of PE-backed companies do not significantly differ from those of the remaining sample of companies.

Table 10 portrays the similar dividend policy analysis, but studies the dividend policy changes after a three-year period following a loan withdrawal rather than a bond issuance, with Panel A of Table 10 showing the results of the analysis conducted with the narrower [IPO+0, IPO+6] sample. The coefficient of PE_DUM_t is statistically insignificant in both Models 1 and 2, which implies that private equity-sponsored companies are not more or less likely to pay out dividends at all in the three years following the loan withdrawal than their non-PE-backed peers in the sample. Further, the PE_DUM_t coefficients in Models 3 and 4 are both statistically insignificant and economically relatively questionable, as in the $DIV\_PAYOUT_{t,t+2}$ specification the

coefficient is fairly extreme at -55.314 and in the $DIV\_YIELD_{t,t+2}$ specification rather low at 0.359. However, I do observe a statistically significant PE_DUM_t coefficient of -1.415 for Model 5, which implies that, at the 10% significance level, private equity-owned companies pay out 1.4 pp less in dividends relative to the total assets of the company, when compared to the non-sponsor-owned firms in the sample.

Panel B of Table 10 shows the results for the analysis on dividend policy changes following a loan withdrawal in the full [IPO+0, IPO+12] sample. Contrary to the focused [IPO+0, IPO+6] sample, the coefficients PE_DUM_t are statistically significant at the 5% level in Models 1 and 2. This implicitly suggests that private equity-backed firms are less likely to pay out dividends compared to their non-PE-sponsored counterparties up to 12 years since their initial public offering, although no such payout policy was observed in the period lasting up to 6 years since the company's IPO. Further, the statistically significant (at the 5% level) and economically relative extreme (-80.183) coefficient of in PE_DUM_t Model 3 also implies that PE-backed firms pay out 80.2 pp less in dividends relative to their income before NRI for the financial year, when compared the non-PE-backed companies in the sample. Analysis run on Models 4 & 5, on the other hand, do not yield a statistically significant coefficient for the private equity dummy variable, suggesting further that the dividend yield and the total dividend payout relative to the PE-backed borrower's total assets does not significantly differ from the non-PE-sponsored firms.

I do not observe any of the results of the full [IPO+0, IPO+12] sample in the focused [IPO+0, IPO+6] sample for corporate loan withdrawals or in the full [IPO+0, IPO+12] sample for bond issuances. Thus, it is speculatively safer to note that I do not confidently capture the true effect of private equity ownership on the portfolio companies' dividend policies following a loan withdrawal. Given the overall relatively illogical nature of the dividend policy analysis, that the observation is rather a sample size issue or PE_DUM_t captures some other variation in the data occurring only in the full sampling period. Thereby, I conclude on a speculative note, that I am unable to determine the true dividend policy effect following a loan withdrawal, but given the solid results obtained from the debt capital markets sample, I do not find evidence of excessively high dividends paid out to the private equity owners following a debt issuance.

Table 10. Dividend policy changes after a loan withdrawal – Logit and Tobit regression analysis results

This table presents the Logit (1-2, 6-7) and Tobit (3-5, 8-10) regression results of the analysis of dividend policy changes following a loan withdrawal for both the narrower [IPO+0, IPO+6] sample (1-5) as well as for the full [IPO+0, IPO+12] sample (6-10), that cover all loans issued between immediately after and a maximum of 6 or 12 years since a given firm's initial public offering date. The analysis is run with the four following dependent variables; $DIV\_PAYER\_DUM_{t,t+2}$ is a dummy variable taking the value 1 if the issuer has paid a dividend in at least one of the three years (loan withdrawal year *t* and two preceding financial years *t+1*, *t+2* for all) and taking the value 0 otherwise, $DIV\_PAYOUT_{t,t+2}$ is the three-year average of common dividend divided by end-of-year income before extraordinary items, $DIV\_YIELD_{t,t+2}$ is the three-year average of dividend per share divided by the end-of-year share price in a given year and $DIV/ASSETS_{t,t+2}$ is the three-year average of common dividend divided by the total assets at the beginning of the loan withdrawal year. Coefficients and z- and t-statistics are reported for independent variables. PE_DUM_t is the private equity dummy variable taking the value 1 if the borrower was backed by a private equity or venture capital sponsor on its initial public offering and taking the value 0 otherwise. Definitions for the remaining independent variables are provided in Table 1. For brevity, coefficients and z- and t-statistics for the loan period dummy variables ($LOAN\_PERIOD\_DUM_i$), IPO period dummy variables ($IPO\_PERIOD\_DUM_i$) and country-specific dummy variables ($COUNTRY\_DUM_i$) are not reported in the table. Tobit regressions are run with a lower limit of zero. The analysis is conducted with robust standard errors correcting for heteroscedasticity and the sample is clustered at the borrower level. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level in a two-tailed test.

Panel A

Sample	[IPO+0, IPO+6]									
Dependent Variable	$DIV\_PAYER\_DUM_{t,t+2}$				$DIV\_PAYOUT_{t,t+2}$		$DIV\_YIELD_{t,t+2}$		$DIV/ASSETS_{t,t+2}$	
Model #	*1*		*2*		*3*		*4*		*5*	
Independent Variables	coeff.	P > |z|	coeff.	P > |z|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|
PE_DUM_t	-2.060	0.337	-2.060	0.337	-55.314	0.235	0.359	0.769	-1.415 *	0.063
$TANGIBILITY_{t-1}$	-4.926	0.133	-4.926	0.133	23.068	0.593	-2.524 **	0.047	-1.002	0.276
M_CAP_{t-1}	-0.004	0.654	-0.004	0.654	0.433	0.105	0.005	0.513	-0.002	0.726
AGE_t	0.110 *	0.053	0.110 *	0.053	-1.257 *	0.094	0.025	0.207	-0.024 **	0.042
ROA_{t-1}	14.143	0.173	14.143	0.173	712.941	0.357	-8.924	0.231	22.983 **	0.025
$LOSS\_DUM_{t-1}$	-0.302	0.842	-0.302	0.842	241.135	0.151	-4.840 **	0.031	2.886 *	0.058
$LEVERAGE_{t-1}$	4.871	0.286	4.871	0.286	105.025	0.236	2.467	0.177	2.250 *	0.098
$MARKET\_TO\_BOOK_{t-1}$	-0.043	0.922	-0.043	0.922	-17.968	0.309	-2.452	0.440	0.459	0.142
$UTILITY\_DUM_t$									1.352 **	0.032
$FINANCIAL\_DUM_t$									-0.599	0.434
$RETURN_t$	1.851	0.262	1.851	0.262	-87.951	0.319	-1.221	0.191	-0.464	0.588
$DIV\_PAYER\_DUM_{t-1}$			13.980 ***	0.000						
DIV_PAYOUT_{t-1}					-0.014	0.325				
DIV_YIELD_{t-1}							0.166	0.136		
$DIV/ASSETS_{t-1}$									0.045	0.123
n	192		192		192		192		189	
Pseudo R^2	0.343		0.343		0.077		0.163		0.285	

Table 10. (Continuing)

Panel B

Sample	[IPO+0, IPO+12]									
Dependent Variable	$DIV\_PAYER\_DUM_{t,t+2}$				$DIV\_PAYOUT_{t,t+2}$		$DIV\_YIELD_{t,t+2}$		$DIV/ASSETS_{t,t+2}$	
Model #	*6*		*7*		*8*		*9*		*10*	
Independent Variables	coeff.	P > |z|	coeff.	P > |z|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |t|
PE_DUM_t	-1.558 **	0.019	-1.558 **	0.019	-80.183 **	0.036	-1.082	0.436	-0.425	0.495
$TANGIBILITY_{t-1}$	-0.787	0.704	-0.787	0.704	-28.820	0.550	-0.223	0.873	3.110	0.104
M_CAP_{t-1}	-0.005	0.633	-0.005	0.633	-0.729	0.140	-0.020	0.367	-0.008	0.167
AGE_t	0.011	0.485	0.011	0.485	-1.033 *	0.087	0.043 *	0.064	-0.016 *	0.065
ROA_{t-1}	-0.392	0.946	-0.392	0.946	359.280	0.236	-1.313	0.835	16.843 ***	0.003
$LOSS\_DUM_{t-1}$	-1.176	0.269	-1.176	0.269	124.933	0.192	-2.706 **	0.042	1.916 **	0.032
$LEVERAGE_{t-1}$	3.120 *	0.061	3.120 *	0.061	37.305	0.573	2.798	0.111	3.771 ***	0.006
$MARKET\_TO\_BOOK_{t-1}$	-0.182	0.618	-0.182	0.618	-21.898	0.315	-0.130	0.751	0.507	0.108
$UTILITY\_DUM_t$									0.105	0.844
$FINANCIAL\_DUM_t$									2.298 *	0.088
$RETURN_t$	0.003	0.997	0.003	0.997	-111.379 **	0.030	-0.843	0.376	0.286	0.640
$DIV\_PAYER\_DUM_{t-1}$			2.010 *	0.059						
DIV_PAYOUT_{t-1}					0.013	0.275				
DIV_YIELD_{t-1}							0.315 ***	0.000		
$DIV/ASSETS_{t-1}$									-0.001 ***	0.002
n	453		453		453		453		450	
Pseudo R^2	0.149		0.149		0.033		0.397		0.124	

5.5 Share repurchase evidence

Table 11 presents the results of the novel analysis on share repurchases after a bond issuance. Although share repurchases are a common exit strategy for private equity investors wanting to liquidate their remaining holdings in their portfolio companies after an IPO, it does not seem to be the case for European private equity-backed companies. When studying the statistical and economic significance of the coefficients for the private equity dummy variable PE_DUM_t, in the narrower [IPO+0, IPO+6] sample, I find that they are neither statistically nor economically significant in any of the three specifications (Models 1-3). This result also holds in the full [IPO+0, IPO+12] sample (Models 4-6), with the sign of the coefficients remaining unchanged and the magnitude of the coefficients only changing slightly when moving from the focused sample to the full one. The relatively straightforward results of the analysis suggest that the there is no support for the statement that the share repurchases made by private equity-backed companies would materially differ from those of all the other firms over a 12-year period since the company's IPO. Thus, I can fairly confidently note that European private equity owners do not use share repurchases to excessively compensate their ownership with the proceeds from the issued bond over the three years following since the issuance.

Table 12, on the other hand, presents the results of the same analysis conducted with the corporate loan sample. Very similar to the results observed in the case of the narrower [IPO+0, IPO+6] debt capital markets sample, I find no evidence that private equity-backed companies would be more likely to do share repurchases over the next three years after a loan withdrawal (Model 1). Further, with statistically and economically insignificant PE_DUM_t coefficients of Models 2 & 3, I can also note that total share repurchases relative to the PE-backed company's income before NRI and total assets do not statistically differ from the share repurchases made by non-PE-sponsored firms. Although the coefficients of PE_DUM_t slightly flip in sign and magnitude, when moving to the [IPO+0, IPO+12] sampling period, plausibly a result of the rather limited sample size in the [IPO+0, IPO+6] sample, all PE_DUM_t coefficients in Models 4-6 continue to be statistically insignificant. Thereby, I may conclude that private equity-owned companies do not perform share repurchases after a loan withdrawal any more than their non-PE-sponsored peer companies.

Table 11. Share repurchases after a bond issuance – Logit and Tobit regression analysis results

This table presents the Logit (1, 4) and Tobit (2-3, 5-6) regression results of the analysis of share repurchases following a bond issuance for both the narrower [IPO+0, IPO+6] sample (1-3) as well as for the full [IPO+0, IPO+12] sample (4-6), that cover all bonds issued between immediately after and a maximum of 6 or 12 years since a given firm's initial public offering date. The analysis is run with the three following dependent variables; $SHARE\_REPUR\_DUM_{t,t+2}$ is a dummy variable taking the value 1 if the issuer has bought back shares in at least one of the three years (bond issue year *t* and two preceding financial years *t+1, t+2* for all) and taking the value 0 otherwise, $SHARE\_REPUR_{t,t+2}$ is the three-year average of share repurchases divided by end-of-year income before extraordinary items and $SHARE\_REPUR/ASSETS_{t,t+2}$ is the three-year average of share repurchases divided by the total assets at the beginning of the bond issue year. Coefficients and z- and t-statistics are reported for independent variables. PE_DUM_t is the private equity dummy variable taking the value 1 if the bond issuer was backed by a private equity or venture capital sponsor on its initial public offering and taking the value 0 otherwise. Definitions for the remaining independent variables are provided in Table 1. For brevity, coefficients and z- and t-statistics for the bond period dummy variables ($BOND\_PERIOD\_DUM_i$), IPO period dummy variables ($IPO\_PERIOD\_DUM_i$) and country-specific dummy variables ($COUNTRY\_DUM_i$) are not reported in the table. Tobit regressions are run with a lower limit of zero. The analysis is conducted with robust standard errors correcting for heteroscedasticity and the sample is clustered at the bond issuer level. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level in a two-tailed test.

Sample	[IPO+0, IPO+6]						[IPO+0, IPO+12]					
Dependent Variable	$SHARE\_REPUR\_DUM_{t,t+2}$		$SHARE\_REPUR_{t,t+2}$		$SHARE\_REPUR/ASSETS_{t,t+2}$		$SHARE\_REPUR\_DUM_{t,t+2}$		$SHARE\_REPUR_{t,t+2}$		$SHARE\_REPUR/ASSETS_{t,t+2}$	
Model #	*1*		*2*		*3*		*4*		*5*		*6*	
Independent Variables	coeff.	P > |z|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |z|	coeff.	P > |t|	coeff.	P > |t|
PE_DUM_t	-0.542	0.553	-0.921	0.374	0.163	0.845	-0.699	0.309	-0.522	0.399	0.047	0.889
$TANGIBILITY_{t-1}$	0.334	0.775	-1.240	0.420	-0.016	0.900	0.206	0.800	-2.455	0.170	0.003 *	0.076
M_CAP_{t-1}	-0.051 *	0.057	-0.004	0.348	0.000	0.523	-0.009	0.275	0.001	0.896	-0.001 **	0.040
AGE_t	-0.014	0.252	-0.014	0.331	0.000	0.527	-0.015	0.108	-0.007	0.372	0.000	0.550
$DIV\_PAYER\_DUM_{t-1}$	0.552	0.417	0.288	0.466	0.025	0.505	0.100	0.819	-0.343	0.343	-0.055	0.588
ROA_{t-1}	-1.851	0.695	-2.530	0.776	0.098	0.911	-0.832	0.784	-1.894	0.712	0.277	0.145
$LOSS\_DUM_{t-1}$	-0.926	0.452	-0.695	0.374	-0.018	0.766	-0.565	0.421	-2.895	0.253	-0.016	0.716
$LEVERAGE_{t-1}$	-1.935	0.187	0.398	0.710	-0.090	0.425	-0.218	0.848	-0.390	0.714	-0.019	0.732
$MARKET\_TO\_BOOK_{t-1}$	-0.486	0.256	-0.085	0.735	0.000	0.987	0.116	0.708	0.348	0.414	0.003	0.224
$UTILITY\_DUM_t$					-0.073 *	0.076					0.035	0.881
$FINANCIAL\_DUM_t$					-0.122 *	0.052					-0.112 **	0.042
$SUBSIDIARY\_DUM_t$	0.697	0.593	-0.007	0.995	0.222	0.212	0.407	0.688	1.067	0.407	0.343	0.141
$RETURN_t$	-0.535	0.251	-0.011	0.974	0.015	0.667	-0.773 *	0.085	-0.538	0.414	-0.025	0.377
$SHARE\_REPUR\_DUM_{t-1}$	3.858	0.000					3.670 ***	0.000				
$SHARE\_REPUR_{t-1}$			-0.029	0.423					-0.001	0.957		
$SHARE\_REPUR/ASSETS_{t-1}$					0.035	0.242					0.059 ***	0.002
n	454		485		467		1230		1247		1197	
Pseudo R^2	0.545		0.030		0.051		0.585		0.014		0.977	

Table 12. Share repurchases after a loan withdrawal – Logit and Tobit regression analysis results

This table presents the Logit (1, 4) and Tobit (2-3, 5-6) regression results of the analysis of share repurchases following a loan withdrawal for both the narrower [IPO+0, IPO+6] sample (1-3) as well as for the full [IPO+0, IPO+12] sample (4-6), that cover all loans issued between immediately after and a maximum of 6 or 12 years since a given firm's initial public offering date. The analysis is run with the three following dependent variables; $SHARE\_REPUR\_DUM_{t,t+2}$ is a dummy variable taking the value 1 if the issuer has bought back shares in at least one of the three years (loan withdrawal year *t* and two preceding financial years *t+1, t+2* for all) and taking the value 0 otherwise, $SHARE\_REPUR_{t,t+2}$ is the three-year average of share repurchases divided by end-of-year income before extraordinary items and $SHARE\_REPUR/ASSETS_{t,t+2}$ is the three-year average of share repurchases divided by the total assets at the beginning of the loan withdrawal year. Coefficients and z- and t-statistics are reported for independent variables. PE_DUM_t is the private equity dummy variable taking the value 1 if the borrower was backed by a private equity or venture capital sponsor on its initial public offering and taking the value 0 otherwise. Definitions for the remaining independent variables are provided in Table 1. For brevity, coefficients and z- and t-statistics for the loan period dummy variables ($LOAN\_PERIOD\_DUM_i$), IPO period dummy variables ($IPO\_PERIOD\_DUM_i$) and country-specific dummy variables ($COUNTRY\_DUM_i$) are not reported in the table. Tobit regressions are run with a lower limit of zero. The analysis is conducted with robust standard errors correcting for heteroscedasticity and the sample is clustered at the borrower level. *** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at the 10% level in a two-tailed test.

Sample	[IPO+0, IPO+6]						[IPO+0, IPO+12]					
Dependent Variable	$SHARE\_REPUR\_DUM_{t,t+2}$		$SHARE\_REPUR_{t,t+2}$		$SHARE\_REPUR/ASSETS_{t,t+2}$		$SHARE\_REPUR\_DUM_{t,t+2}$		$SHARE\_REPUR_{t,t+2}$		$SHARE\_REPUR/ASSETS_{t,t+2}$	
Model #	*1*		*2*		*3*		*4*		*5*		*6*	
Independent Variables	coeff.	P > |z|	coeff.	P > |t|	coeff.	P > |t|	coeff.	P > |z|	coeff.	P > |t|	coeff.	P > |t|
PE_DUM_t	-0.047	0.966	0.811	0.848	-0.513	0.241	0.930	0.127	2.051	0.668	0.170	0.490
$TANGIBILITY_{t-1}$	-0.173	0.925	-9.848 **	0.031	-1.001 **	0.012	1.150	0.343	-5.880	0.263	0.124	0.671
M_CAP_{t-1}	-0.009	0.296	-0.026	0.201	-0.002	0.235	-0.018 *	0.079	0.011	0.733	-0.002	0.308
AGE_t	-0.032	0.240	-0.025	0.610	-0.007	0.117	-0.019 **	0.044	-0.135 **	0.012	-0.007 ***	0.010
ROA_{t-1}	-3.344	0.510	37.005 **	0.012	4.526 **	0.041	-8.375 **	0.034	28.603	0.443	-0.409	0.837
$LOSS\_DUM_{t-1}$	-0.781	0.384	0.427	0.862	0.135	0.630	-0.947	0.274	5.390	0.312	-0.107	0.554
$LEVERAGE_{t-1}$	-2.023	0.340	-11.708 *	0.052	-0.867 *	0.075	-0.923	0.551	-7.184	0.509	-0.035	0.941
$MARKET\_TO\_BOOK_{t-1}$	0.448 *	0.070	1.079	0.264	0.054	0.527	0.420 *	0.078	-1.659	0.659	-0.059	0.622
$UTILITY\_DUM_t$					-0.494	0.133					-0.246	0.277
$FINANCIAL\_DUM_t$					-0.794 **	0.047					-0.470 **	0.038
$RETURN_t$	-0.658	0.375	0.171	0.919	0.312 *	0.087	-0.371	0.479	-1.713	0.608	0.058	0.722
$SHARE\_REPUR\_DUM_{t-1}$	5.154	0.025					5.170 ***	0.000				
$SHARE\_REPUR_{t-1}$			0.041	0.360					-0.201	0.327		
$SHARE\_REPUR/ASSETS_{t-1}$		.			0.172	0.205					0.379 ***	0.000
n	189		192		189		450		453		450	
Pseudo R^2	0.419		0.123		0.269		0.468		0.037		0.209	

5.6 Robustness of results

Two robustness checks were conducted to test the persistence of results in the debt capital market and corporate samples in the focused sampling period. First, the analyses were run with a data sets where the large bulk of financial sector issuers (SIC codes 6000-6799) were excluded from the sample. Further, an alternative robustness check sample that limits the number of bonds or loans per company to one and remove all subsequent issues of a given company from the sample was also analyzed. Both of the robustness check yielded similar results, where possible, while slightly lowering the observed difference between PE-backed and non-PE-backed companies' credit ratings and spreads, as financial sector issuers form a significant portion of the subsequent issues, as well as issuers in general. Further, Reliability of observations from the focused sample of corporate loans was slightly compromised as a result of the decrease in sample size.

6. Discussion of results

When contrasting my European findings with those of Huang et al. (2016) conducted with a US-based sample, the European capital markets seem to view the involvement of a private equity owner in a fairly different way than the North American investors do.

On a general note, the analysis yields the following three main results; first, debt investors demand higher yields on European private equity-backed companies' credit in the first six years after the company's IPO. Bond yield spreads (loan spreads) for European PE-backed companies are on average 93 pp (70 pp) higher when comparing to the general set of other IPO companies. Second, European private equity-sponsored firms are rated slightly below their non-PE-backed peers by Moody's, who rate PE-sponsored companies' bonds on average two notches lower than their non-sponsor counterparts. Finally, private equity-backed companies invest less and pay lower amounts of dividends over the three-year period following a debt issuance relative to the size of the firms, when compared to the non-PE-sponsored firms. Empirical evidence from the US market suggests that PE-backed companies have better credit ratings, receive bond financing with lower yields, invest more modestly and pay out less dividends in the three years after a debt issuance, when compared to the non-PE-sponsored companies (Huang et al., 2016). Thereby, my analysis yields novel results to the European market on PE-sponsored firms' credit

ratings and cost of debt and confirms the earlier findings by Harford and Kolasinski (2014) and Huang et al. (2016) that PE owners do not exploit bondholders by transferring wealth through overinvestment and excessive payout policies.

Results from the credit rating analysis provide some evidence for *H1* and against *H2* as I do see evidence that private equity-sponsored companies' bonds have lower ratings in both sampling periods by Moody's and in the larger sampling period by S&P – a finding that is unique to Europe and my study. The result does suggest to some extent that rating agencies view European private equity ownership as a credit negative factor, possibly because of their exploitative governance structures. The result does not, however, survive in the loan market, where neither Moody's nor S&P ratings were affected by private equity ownership[13], perhaps suggesting lower information asymmetries between PE investors and banks compared to PE owners and bondholders. Further, as repeat borrowers in the fairly bank-centered borrowing environment of Europe, private equity investors may view their reputation among their core banking group as more valuable than among the general bond investor space. Implicitly, the result would support the finding of Ashbaugh-Skaife et al. (2006), who suggest that poor governance structures, i.e. significant blockholder ownership or CEO power, cause the lower credit rating observed for PE-backed companies.

In the yield and loan spread analysis, I do find evidence for *H1* and against *H2* in the narrower [IPO+0, IPO+6] sampling period, and observed higher spreads of PE-backed companies hold for both bond yields (93 pp increase) and loan yields (70 pp increase), when compared to non-PE-baked firms. The same result holds in the larger [IPO+0, IPO+12] sample with the increase relative to non-PE-backed companies is 92 pp (93 pp) for PE portfolio firms' yield spreads (loan spreads). This finding does provide evidence for *H1* and against *H2* to some extent. The observation suggests that over the period of up to 6 years from the IPO, private equity-owned companies pay significantly more on their debt instruments, when comparing to the entire sample of IPO companies. Some factors, however, contribute to the persistence of such high spread levels of formerly PE-backed companies in the longer term. The observation could arise from the exploitative behavior of the sponsor, but as private equity owners usually tend to exit

[13] My corporate loan analysis implied with weak statistical significance that in the focused sampling period, S&P ratings were on average 7 notches lower for sponsor-backed companies, when compared to non-PE-backed firms. However, as per the discussion in Section 5.1, I consider the extreme result to be more a result of a few outlying observations, rather than an implication on PE-backed companies' exploitative behavior.

the companies approximately five years after the IPO, the observation can also be tied to a deteriorating governance under a new management team of the former PE portfolio companies after the private equity investors have fully exited the firms.

Elysiani et al. (2010) come to the conclusion that the long-term orientation of PE-ownership is a key driver in mitigating agency costs and thus reducing the cost of debt. With respect to their finding, the observably higher spreads of PE-backed companies may be the result of the relatively immature private equity market of Europe (Robinson and Sensoy, 2011). If lenders would not have as strong long-term relationships with the private equity owners in Europe as they have in the US, the findings of Diamond (1989) on long-term reputation could also further explain, why US-based PE-backed companies pay less on their debt than their non-PE-backed peers and why the observation is the opposite in Europe. Further, to explain why bond yields of PE-backed companies have a higher when compared to the loan spreads of PE-backed firms, the observation can be thought to relate to the findings of Hale and Santos (2009). The authors conclude that banks have better access to insider non-public information and thus may be better in alleviating informational asymmetries arising from the European private equity ownership.

Saunders and Steffen (2011) find that PE-backed companies listing to a relatively small secondary marketplace have a higher cost of debt than the non-PE-backed companies do. As my European sample consists of 17 European countries with a much greater amount of secondary marketplaces, the observation of higher spreads can actually be a result of the fragmented capital markets of Europe rather than exploitative governance structures implemented by the private equity owner. Barclay et al. (1993) and Aslan and Kumar (2012) among others, conclude that the presence of a large blockholder negatively affects the pricing of a company's cost of debt. When applying their finding in the context of European private equity-backed companies, it is possible to comment on a speculative note, that PE investors retain a significant holding in the company post-IPO and large concentrated PE ownership is one possible explanation for the higher spreads observed PE-owned companies' debt.

Interestingly, the investment policy analysis yields results providing evidence against *H3*, as the capital expenditure levels of private equity-backed companies are lower for the firms in the general IPO company sample after a bond issuance, i.e. private equity-sponsored companies invest less relative to their size over the next three years after the large influx of capital through a bond issuance. Consequently, the investment levels are somewhat higher in the full sampling

period, yet still below the non-PE-backed peers, possibly capturing the change in investment policies following a PE owner exiting the firm. Findings from the corporate loan sample are less strong and investments of PE-backed companies after a loan withdrawal are on average in line with those of the non-sponsor-backed companies in the focused sampling period. However, the results for the corporate loan sample for the full sampling period are very much in line with the observations from the bond market. Evidence against *H3* also provides some evidence for *H2* and against *H1*, as private equity owners seem to have bondholder-friendly investment policies and do not seem to engage in overly excessive investment programs aiming to solely maximize the value of their equity ownership. Consequently, the results are in line with those of Huang et al. (2016), who also observe the bondholder-friendly investment policies of former PE portfolio companies. The result is also in line with Harford and Kolasinski (2014), who find that PE owners do not exploit the debtholders of their portfolio companies through excessive investment and payout policies.

When it comes to the dividend policies of private equity-backed companies after a bond issuance, my findings are also partially in line with those of Huang et al. (2016). I observe that private equity-backed companies are more likely to pay dividends in general in the three years following the bond issuance, whereas Huang et al. (2016) conclude PE-backed firms are actually less likely to pay dividends at all when comparing with the other IPO companies. However, similar to Huang et al. (2016), I observe that of the companies that do pay dividends, private equity-sponsored firms are more modest in terms of the size of the dividend payout compared to the non-PE-backed companies. The result only holds in the focused sampling period and the likely payout policy changes can be seen to have an effect on the failure to observe the similar pattern in the full sampling period. The results obtained from the corporate loan sample are somewhat conflicting in nature, suggesting that my analysis does not capture the full dividend policy effect following a loan withdrawal.

The overall finding on PE-backed firms' dividend policies does provide support against *H4* and thereby partial support against *H1* and for *H2*, as I see no evidence of PE-backed companies paying excessively large dividends to the sponsor owners. Further, the relatively lower dividend payments can imply that private equity investors are concerned with their reputation and have implemented bondholder friendly payout structures. Alternatively, the relatively lower dividend payout levels can be a mere result of the private equity owner wanting to retain a greater portion of free cash flow in the growth of the company to further increase the value of its shareholding.

The results of my unique share repurchase analysis, which show no evidence of a statistically significant difference in share repurchase activities between PE-backed and non-PE-backed companies in the next three years after the debt issuance, are not in favor of *H5*. The result suggests that former PE portfolio companies use share repurchases in the similar extent as the non-PE-owned companies do, and that private equity-owned companies do not use debt proceeds excessively in share repurchases e.g. for exit purposes. The observation holds for both bond and loan markets and applies in the narrower as well as in the full sampling period.

My observation of PE-backed companies paying less dividends than the non-sponsor-backed companies do seems to be partly in line with Jain et al. (2009), who find that the dividend paying companies are less likely to be backed by venture capital firms and that VC-owned companies tend to use share repurchases as their preferred payout method. As I fail to detect any difference in the share repurchase policies between PE-backed and non-PE-backed companies, in light of Maxwell and Stephens (2003), who conclude that share repurchases may transfer wealth from bondholders to equity holders, I can safely note that I find no evidence supporting the claim that PE owners exploit their bondholders through excessive payout policies.

As a whole, the results of the credit rating and spread analyses do show some evidence for the *Wealth Expropriation Hypothesis* and suggest that private equity-backed companies have slightly weaker credit performance through lower credit ratings and higher yield spreads. However, a deeper follow-up analysis on the use of bond and loan proceeds is more in favor of the *Reputation Acquisition Hypothesis*, as the private equity-backed companies have both more modest investment plans and dividend policies relative to the other IPO companies, offering support against the *Overinvestment Hypothesis*, *Excessive Dividend Hypothesis* and *Buyback Exit Hypothesis*. This can imply that, while the private equity investors are indeed concerned about their reputation and do not enforce governance structures that exploit bondholders, other characteristics in the private equity ownership or the company characteristics account[14] for the observed difference in the credit quality between PE-owned and non-PE-owned firms.

[14] For example, PE-backed companies in the sample were smaller in terms of market capitalization, more levered, issued larger amounts of debt and were less mature in age, when comparing to the non-PE-backed companies

7. Conclusion

This thesis studies the reputation effect of European private equity investors. I focus my analysis on the European debt capital markets and corporate loan markets by studying the bonds and loans issued by PE-backed and non-PE-backed companies from 17 European countries during the period between January 1, 1981 and June 30, 2015. I construct the sample by distinguishing between whether the debt issuer was backed by a private equity or venture capital investors on its IPO and construct two time period samples, the focused [IPO+0, IPO+6] sampling period and the full [IPO+0, IPO+12] sampling period.

My hypotheses revolve around the reputational concerns of private equity owners and their implications on the PE portfolio firms' bond and loan metrics. *Wealth Expropriation Hypothesis* suggests PE owners aim to maximize the value of their ownership and thus exploit the debtholders of the firm, which leads to an increase in the PE portfolio firm's cost of debt. *Reputation Acquisition Hypothesis*, on the other hand, implies that PE owners value their reputation highly and are willing to implement bondholder-friendly governance structures that lower the cost of debt for their portfolio companies. My three other hypotheses follow up exploitative nature of PE ownership and study the investment and payout policies of private equity-backed companies following the debt issuance. *Overinvestment Hypothesis* suggests PE-backed companies invest in too risky projects after their IPO, *Excessive Dividend Hypothesis* implies PE-backed companies pay high dividends to their owners after a debt issuance and *Buyback Exit Hypothesis* indicates PE-owned companies to increase share repurchases following a bond issuance or loan withdrawal.

I test my hypotheses by creating a private equity dummy variable (PE_DUM_t) that takes the value 1 if the debt issuing company was backed by a private equity investor on its IPO and zero otherwise. I then run a series of multivariate analyses studying the relationship of private equity ownership and different credit metrics of the bonds and loans (credit ratings, bond yield spread and loan spread) as well as study the investment and payout policy changes (capital expenditure, dividends and share repurchases) over the three years following a bond or loan issuance.

My analysis yields three main results; first, bond yield spreads (loan spreads) for European PE-backed companies are on average 93 pp (70 pp) higher when comparing to the general set of

other IPO companies over the first six years after their IPO. Second, European private equity-sponsored firms are rated on average two notches lower than their non-sponsor counterparts by Moody's during the first six years after the company has been listed. Finally, private equity-backed companies invest less and pay lower amounts of dividends over the three-year period following a debt issuance relative to the size of the firms, when compared to the non-PE-sponsored firms. When contrasting my results to a similar US-based study of Huang et al. (2016), I find that debt investors to view European private equity ownership somewhat differently from the North American PE ownership.

Although I find that European private equity-owned companies are viewed inherently riskier in terms of their credit metrics compared to the non-sponsor-backed firms, I observe no evidence of exploitative governance structures in PE-backed companies and suggest that the reputation effect plays a vital role in ensuring that bondholder friendly governance structures are implemented in PE portfolio companies.

As the scope of this thesis extends to analyzing how private equity investors' reputational concerns affect its credit metrics. While no exploitative governance structures were observed, PE-backed companies are still implicitly rated below their non-PE-backed peers and PE portfolio companies pay higher spreads on their financing, the inherent question of why this is observed is left unanswered. Topics for further research include studying the fundamentals of private equity ownership further to better understand the underlying mechanism that affects the observed credit metrics. Further, another topic to consider is to complement the findings of this thesis and that of Huang et al. (2016) by constructing a study on the loan market implication from the North American market and introducing share repurchases as a possible exploitative payout method after a bond or loan issuance.

Appendices

Appendix A – Descriptive statistics for [IPO+0, IPO+12] sampling period

Table 13 presents the descriptive statistics for the full [IPO+0, IPO+12] sampling period for both the debt capital markets and corporate debt data sets. By looking at the descriptive statistics for the focused [IPO+0, IPO+12] sampling period presented in Table 13 (Panel A), I note that the mean and median credit ratings of PE-sponsored firms for both S&P and Moody's are observably lower than the ratings of the non-PE-backed companies. A similar observation holds also for yield spreads, as the mean and median yield spread is noticeably higher for PE-backed companies when compared to the non-PE-backed firms of the sample. However, in the case of loan spreads, PE-backed firms have noticeably lower mean and median spreads when compared to the non-PE-backed companies. Other mentionable findings from the [IPO+0, IPO+12] statistics (Panel B) are very similar to those observed in the focused [IPO+0, IPO+6] sampling period, as sponsor-backed firms are more levered and smaller in terms of market capitalization when compared to the non-PE-backed companies, even up to 12 years since the company's IPO. Further, sponsor-backed companies continue to issue larger debt instruments and are observably younger on issuance than their non-sponsor-backed peer companies are. Maturities of the instruments are remain equal for PE-backed and non-PE-backed firms and PE-backed companies stock returns seem to observably outperform the stock returns of the non-PE-backed firms over a one-year period before the bond issue date.

Comparison between the PE-backed firms in the debt capital markets sample and corporate loan sample in the full sampling period also yield similar results to the findings in [IPO+0, IPO+6] sampling period. I find that the raised loan amounts are larger than the financing raised through bonds and maturities on withdrawn loans are shorter than on issued bonds, with companies taking loan financing also being slightly older than the firms issuing bonds are. Additionally, the PE-backed firms in the corporate loan sample continue to be larger in terms of market capitalization than companies in the debt capital markets sample. Contrary to the focused sample, PE-backed companies withdrawing loans in the full sampling period are less likely to make a loss than the bond-issuing sponsor-backed are.

Table 13. Descriptive statistics for post-IPO bond issuances and loan withdrawals – [IPO+0, IPO+12]

This table presents the sample sizes, medians and means of both the dependent variables (Panel A) and independent variables (Panel B) used in this study. The table shows statistics for both the final debt capital markets sample and the final corporate loan sample in the full [IPO+0, IPO+12] sampling period that cover all bonds and loans issued between immediately after and a maximum of 12 years since a given firm's initial public offering date. For both samples, the statistics are reported separately for the PE-backed IPOs (i.e. PE_DUM_t taking the value 1) and for all the IPOs in a given sample (i.e. PE_DUM_t taking either the value 0 or 1). PE_DUM_t is the private equity dummy variable taking the value 1 if the bond issuer was backed by a private equity or venture capital sponsor on its initial public offering and taking the value 0 otherwise. For brevity, statistics for the bond period dummy variables ($BOND\_PERIOD\_DUM_i$), loan period dummy variables ($LOAN\_PERIOD\_DUM_i$), IPO period dummy variables ($IPO\_PERIOD\_DUM_i$) and country-specific dummy variables ($COUNTRY\_DUM_i$) are not reported in the table.

Panel A

Sample	Debt Capital Markets [IPO+0, IPO+12]				Corporate Loan [IPO+0, IPO+12]			
Subsample	*PE-Backed IPOs*		*All IPOs*		*PE-Backed IPOs*		*All IPOs*	
n	*105*		*1249*		*96*		*453*	
Dependent Variables	Median	Mean	Median	Mean	Median	Mean	Median	Mean
$S\&P\_RATING_t$	10.000	9.830	14.000	13.715	9.000	9.450	11.000	10.846
$MOODY'S\_RATING_t$	7.500	8.811	15.000	14.381	8.000	8.342	11.000	10.976
$YIELD\_SPREAD_t$	238.010	272.621	76.870	100.598				
$LOAN\_SPREAD_t$					38.000	115.976	90.000	132.277
$CAPEX/TANG_{t,t+2}$	0.128	38.720	4.159	22.882	-6.786	166.648	7.610	17.219
$CAPEX/AT_{t,t+2}$	3.853	4.979	2.644	4.199	5.034	5.411	5.639	6.665
$(CAPEX+RD)/AT_{t,t+2}$	4.531	5.444	2.922	4.467	5.610	5.828	6.130	7.153
$DIV\_PAYER\_DUM_{t,t+2}$	1.000	0.885	1.000	0.778	1.000	0.786	1.000	0.934
$DIV\_PAYOUT_{t,t+2}$	34.498	40.464	28.659	66.457	33.516	31.263	38.085	133.892
$DIV\_YIELD_{t,t+2}$	2.174	2.459	3.262	4.377	2.883	1.975	3.061	5.529
$DIV/ASSETS_{t,t+2}$	1.588	1.853	0.420	1.412	2.001	1.907	1.864	3.002
$SHARE\_REPUR\_DUM_{t,t+2}$	0.000	0.164	0.000	0.215	0.000	0.476	0.000	0.355
$SHARE\_REPUR_{t,t+2}$	0.000	10.946	0.000	4.862	0.000	5.604	0.000	6.510
$SHARE\_REPUR/ASSETS_{t,t+2}$	0.000	0.730	0.000	0.288	0.000	0.247	0.000	0.463

Table 13. (Continuing)

Panel B

Sample	Debt Capital Markets [IPO+0, IPO+12]				Corporate Loan [IPO+0, IPO+12]			
Subsample	*PE-Backed IPOs*		*All IPOs*		*PE-Backed IPOs*		*All IPOs*	
n	*105*		*1249*		*96*		*453*	
Independent Variables	Median	Mean	Median	Mean	Median	Mean	Median	Mean
PE_DUM_{t}	1.000	1.000	0.000	0.084	1.000	1.000	0.000	0.212
$DEFAULT\_SPREAD_{t}$	101.200	100.389	106.100	123.253				
$PROCEEDS_{t}$	0.444	1.381	0.304	0.742	0.740	0.870	0.737	1.624
$MATURITY_{t}$	7.036	9.324	7.022	8.145	5.003	4.424	5.003	3.974
$EXTENDABLE\_DUM_{t}$					0.000	0.167	0.000	0.126
$REVOLVER\_DUM_{t}$					0.500	0.452	1.000	0.543
$SUBORD\_DUM_{t}$	0.000	0.033	0.000	0.086	0.000	0.000	0.000	0.009
$FIRST\_BOND\_DUM_{t}$	0.000	0.393	0.000	0.122				
$FIRST\_LOAN\_DUM_{t}$					0.000	0.190	0.000	0.170
$TOTAL\_BONDS_{t}$	2.000	2.951	11.000	30.902				
$TOTAL\_LOANS_{t}$					5.000	8.000	4.000	6.848
M_CAP_{t-1}	3.700	4.177	13.093	27.990	5.453	5.360	6.451	17.562
AGE_{t}	12.510	21.778	22.115	36.646	13.045	22.428	14.019	27.037
ROA_{t-1}	0.033	0.023	0.009	0.023	0.042	0.046	0.043	0.046
$LOSS\_DUM_{t-1}$	0.000	0.148	0.000	0.065	0.000	0.095	0.000	0.095
$ICR_{0,t-1}$	3.910	2.942	1.999	3.398	4.531	3.786	3.598	4.747
$ICR_{5,t-1}$	0.000	1.056	0.000	1.858	0.000	1.067	0.000	2.535
$ICR_{10,t-1}$	0.000	0.374	0.000	1.702	0.000	0.469	0.000	2.375
$ICR_{20,t-1}$	0.000	0.224	0.000	1.947	0.000	0.174	0.000	3.184
$LEVERAGE_{t-1}$	0.304	0.408	0.215	0.238	0.395	0.399	0.337	0.351
$MARKET\_TO\_BOOK_{t-1}$	1.174	1.290	0.526	0.754	1.616	1.591	1.154	1.294
$TANGIBILITY_{t-1}$	-0.009	-0.024	0.039	0.079	-0.106	-0.017	0.108	0.079
$UTILITY\_DUM_{t}$	0.000	0.000	0.000	0.147	0.000	0.000	0.000	0.168
$FINANCIAL\_DUM_{t}$	0.000	0.197	0.000	0.493	0.000	0.071	0.000	0.135
$SOVEREIGN\_RATING_{t}$	19.000	18.475	19.000	18.384	19.000	18.000	19.000	17.274
NET_DEBT_{t}	0.000	0.038	0.007	0.064	0.028	0.104	0.026	0.073
$SUBSIDIARY\_DUM_{t}$	0.000	0.246	0.000	0.019	0.000	0.143	0.000	0.077
$RETURN_{t}$	0.075	0.099	0.033	0.045	0.005	0.026	0.016	0.051
$CAPEX/TANG_{t-1}$	-4.329	-24.681	4.387	30.427	-3.343	68.785	10.108	105.185
$CAPEX/AT_{t-1}$	3.807	4.878	2.634	4.986	5.759	5.666	5.778	6.891
$(CAPEX+RD)/AT_{t-1}$	4.427	5.390	3.069	5.377	6.495	6.096	6.200	7.338
$DIV\_PAYER\_DUM_{t-1}$	1.000	0.541	1.000	0.711	0.000	0.119	0.000	0.457
DIV_PAYOUT_{t-1}	23.249	32.544	23.914	60.825	0.000	47.190	0.000	185.134
DIV_YIELD_{t-1}	1.834	2.259	2.685	3.668	1.931	1.219	2.393	7.427
$DIV/ASSETS_{t-1}$	0.897	0.750	0.341	1.372	0.000	2.225	0.000	27.979
$SHARE\_REPUR\_DUM_{t-1}$	0.000	0.066	0.000	0.155	0.000	0.429	0.000	0.238
$SHARE\_REPUR_{t-1}$	0.000	0.711	0.000	3.404	0.000	5.152	0.000	4.210
$SHARE\_REPUR/ASSETS_{t-1}$	0.000	0.053	0.000	0.264	0.000	0.226	0.000	0.308

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